Consultative Committee for Space Data Systems
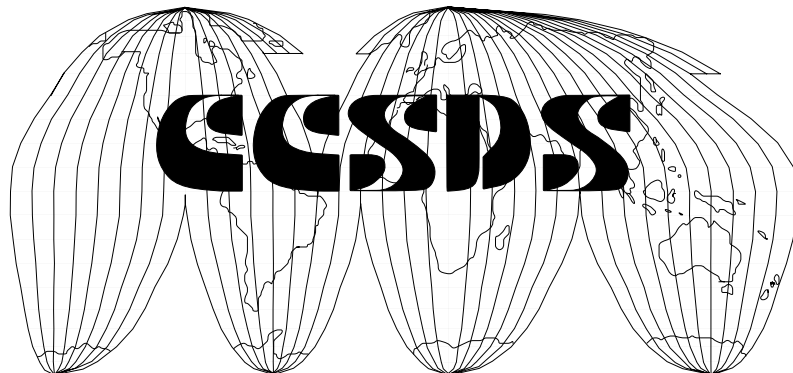
**DRAFT REPORT OF THE
MANAGEMENT COUNCIL**

CCSDS MANAGEMENT COUNCIL
MEETING MINUTES

CCSDS B10.0-Y-23

DRAFT YELLOW BOOK

April 2002

DISTRIBUTION

CCSDS Member Agencies

ASI	Ms. Loredana Bruca
BNSC	Dr. Peter Allan
CNES	Ms. Geneviève Campan
CSA	Mr. Arvind Bastikar
DLR	Dr. Hubertus Wanke
ESA	Jean-François Kaufeler
INPE	Dr. Eduardo W. Bergamini
NASA	Mr. John Kelley
NASDA	Mr. Ryuichi Nagashima
RSA	Mr. Vladimir Starostin

CCSDS Observer Agencies

ASA	Dr. Klaus Pseiner
CAST	Mr. Zhao Heping
CRC	Mr. J.D. Andean
CRL	Mr. Takashi Iida
CSIR	Mr. Renier Balt
CSIRO	Mr. Richard Jacobsen
CTA	Mr. Sergio Costa
DSRI	Dr. Flemming Hansen
EUMETSAT	Mr. R. Wolf
EUTELSAT	Dr. Manuel Calvo
FSST&CA	Mr. Jan Bernard
HNSC	Dr. L. N. Mavridis
IKI	Dr. R. Nazirov
ISAS	Dr. Takahiro Yamada
ISRO	Mr. P. Soma
KARI	Dr. Eunsup Sim
KFKI	Dr. Andras Varga
MOC	Mr. Avi Rahav
NOAA	Mr. George W. Saxton
NSPO	Dr. Guey-Shin Chang
SSC	Mr. Lennart Marcus
SUPARCO	Mr. Khalid Bashir
TsNIIMash	Mr. O.D. Sokolov
USGS	Mr. Tom Kalvelage

Technical Steering Group and Panel/Subpanel Chairs

TSG		Mr. Manfred Drexler (DLR/GSOC)
P1		Mr. Michel Morlon (ESA/ESOC)
	P1A	Mr. Greg Kazz (NASA/JPL)
	P1B	Mr. Gian Paolo Calzolari (ESA/ESOC)
	P1C	Dr. Pen-Shu Yeh (NASA/GSFC)
	P1E	Mr. Jean-Luc Gerner (ESA/ESTEC)
	P1F	Mr. Adrian Hooke (NASA/JPL)
	P1J	Mr. Felipe Flores-Amaya (NASA/GSFC)
P2		Dr. David Giaretta (BNSC/RAL)
		Mr. John Garrett (Raytheon ITSS)
		Mr. Nestor Peccia (ESA/ESOC)
		Mr. Patrick Mazal (CNES)
		Mr. Louis I. Reich (CSC)
		Mr. Donald Sawyer (NASA/GSFC)
P3		Mr. Maurice Winterholer (CNES)
		Mr. Fred Brosi (GST)
		Mr. Martin Pilgram (DLR/GSOC)
		Mr. Michael J. Stoloff (NASA/JPL)

Information

Ms. L. Kezer (NASA HQ)
Dr. Hans Uhrig (ESA/ESOC)
Mr. G. Delmas (ESA/ESOC)
Mr. R. Stephens (GST)
Mr. T. Gannett (GST)
Mr. N. Dissinger (GST)

CONTENTS

SUBJECT: Minutes of the Consultative Committee for Space Data Systems (CCSDS)
           Management Council (MC) Meeting

PLACE: Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) Oberpfaffenhofen,
           Germany

DATE: 18-19 April 2002

I. ATTENDANCE

Organization	Name
ASI	Loredana Bruca
BNSC/RAL	Peter Allan
	David Giaretta
CAST	Chonghua Liu
	Yu-Jia-Ying
	Zhao Heping
CNES	Geneviève Campan
	François Forestier
	MauriceWinterholer
	François Jocteur-Monrozier
DLR	Hubertus Wanke
	Manfred Drexler
ESA	Jean-François Kaufeler
	Michel Morlon
ISAS	Takahiro Yamada
NASA	Jack Kelley
	Adrian Hooke
	Andy Dowen
	Tom Gannett
	Felipe Flores-Amaya
	Linda Kezer
	Neil Dissinger
NASDA	Mikio Sawabe

II.   INTRODUCTION

CCSDS Secretariat Jack Kelley convened the Management Council meeting at 0900 hours on 18 April 2002.

III.   WELCOMING REMARKS

Dr. Hubertus Wanke welcomed the members of the Management Council on behalf of DLR and wished them a successful meeting.

IV.   AGENDA REVIEW AND APPROVAL

The agenda was approved and is shown in Attachment A.

V.   REVIEW OF MINUTES FROM OXFORDSHIRE, UK

The minutes from the Spring 2001 meeting in Oxfordshire, UK received no comments and were approved.

VI.   SECRETARIAT REPORT

The Secretariat Report, consisting of the open action items (Attachment B.) and document status list (Attachment C.), was distributed to the attendees.

VII.   REVIEW OF OPEN ACTIONS ITEMS

Only the open action items from the previous meeting were discussed.

S01-A02:   Each agency should provide brochures, etc., for distribution at the 20th Anniversary session.

Status: Mr. Manfred Drexler and Mr. Kelley will be coordinating the CCSDS 20th Anniversary Plenary. Additionally, Mr. Andy Dowen will be coordinating the meetings for Space Ops 2002 which occurs during the same week as the Plenary. Mr. Dowen stated that CCSDS Principle Delegates need to contribute presentations for the Plenary session and materials and manpower for the booth at Space Ops.   The Secretariat is providing CCSDS materials (CD-ROMs, brochures, mouse-pads, etc.) and delegates should provide marketing material for their respective agencies. It is estimated that 18-20 thousand people will attend Space Ops so it will be a good opportunity to market both CCSDS and the member agencies.   Mr. Kelley requested that each agency provide a schedule for the delivery of materials. Mr. Adrian Hooke added that information concerning CCSDS-compliant products should also be provided at the booth.

S01-A03   Contact Liaison organizations to reconfirm interest.

Status: Ms. Linda Kezer stated that she sent letters to the CCSDS liaison, but did not receive any responses.   It was noted that CCSDS needs a representative for the Interagency Operations Advisory Group (IOAG). Mr. Roland Ivarnez previously provided liaison with IOAG.   Mr. Drexler was appointed the official CCSDS representative to the IOAG since he attends the meetings.   Mr. Peter Shames, who serves as a representative to the Object Management Group (OMG), should also be added to the liaison list.   Due to manpower restrictions, liaisons may not be able to participate in meetings.   In the meantime, CCSDS documentation and meeting correspondence will continue to be provided to the liaisons.

VIII.   CCSDS DEVELOPMENT WEB SITE

Mr. Kelley reported that the CCSDS has discussed an overhaul of the website to improve its appearance and functionality, and also facilitate panel reviews.   Mr. Tom Gannett led a working group that developed requirements for the web site. The development web site is currently available for review at http://secretariat.gst.com. Comments are due by 15 June 2002 (AI MC-S02-A01). A document management application (Docushare) is available on the web site that can be used for file transfer and management. The Management Council will have final approval of the web site before it becomes operational.

IX.   OUTREACH ADVERTISING

Improving communication to the users of CCSDS standards was discussed by Mr. Kelley.   It has been proposed that the Secretariat provide money for advertisement in trade journals and the Principle Delegates were asked to see if there are any problems with providing agency money for this task. Mr. Kelley stated that NASA would not provide money for advertisements in private journals, but would provide funds for NASA- sponsored journals. BNSC and CNES stated that they would place ads in their agency journals. The purpose of advertising is to communicate what CCSDS has accomplished in response to other groups that provide standards that are not space-qualified. The Secretariat will develop an advertisement and an article that can be published in NASA journals (AI MC-S02-02). The advertisement will be supplied to the Principle Delegates for use as a template for submission to their respective journals.

The following examples of the cost to advertise in trade journals were reported:

Space News: US $6200 full page, $5000 half page – circulation 25,000 people
Aviation Weekly: US $1400 full page – circulation 100,000 people

Mr. Dowen will investigate the possibility of submitting advertisements for CCSDS during Space Ops.

X.   AGENCY REPORTS

ASI - Ms. Loredana Bruca reported that ASI's newly appointed president has started revising the ASI Space Plan.   ASI has allocated for industrial participation in the CCSDS panels and is expect to provide 2.5 man-years support.   New programs shall, as far as possible, adhere to CCSDS implementations such as SLE. The ASI report is shown in Attachment D.

BNSC - Dr. Peter Allan reported that support for CCSDS is jointly funded by BNSC and other resources (50% BNSC, 50% other).   CCSDS documents are reviewed through the British Standards Institute (BSI). BSI will be the new focal point with the intention of improving the flow of information and increasing participation. CCSDS support is funded at 2 man-years. Other support for implementations is funded separately. A problem with funding for P1, due to a retirement at BNSC, should be rectified soon.   BNSC provides the chairman for P2 that has seen increased interest outside of the space community for the Open Archival Information System (OAIS) recommendation.   UK-based Vega is developing a prototype implementation of SLE Services that will provide backup capability at RAL and also allow the use of the Consolidated Space Operations Contract (CSOC) resources. The BNSC report is shown in Attachment E.

CNES - Mr. François Forestier reported that CNES support for CCSDS activities is currently at 3 man-years.   To ensure interoperability, SLE Transfer Services will be implemented at CNES, NASA/JPL, and ESOC for future Mars missions. CNES has also been active with OAIS meetings and is using EAST for Helios, Jason and Envisat data. The CNES report is shown in Attachment F.

CSA - The CSA delegation did not attend and no report was submitted.

DLR- Mr. Drexler stated that DLR provides the chairman of the TSG and is active in panels P1E and P1J. SLE Services are included in the DLR organization plan.

ESA – Mr. Jean-François Kaufeler reported that ESA has implemented SLE services for the Integral mission and plans to utilize Service Management in the future.   ESA continues to work on the development of space data standards within the ECSS group that complements CCSDS. The ESA report is shown in Attachment G.

INPE – INPE was unable to attend the MC meeting, but Dr. Eduardo Bergamini provided the report shown in Attachment H.

NASA – Mr. Kelley stated that a new administrator has been appointed and restructuring is currently underway at NASA.   As part of the restructuring, the NASA Data Systems Standards Committee (NDSSC) was formed to coordinate the diversified data standards groups within NASA. Mr. Dowen has been appointed Program Manager of the Standards Development group. Mr. Dowen stated that the NASA budget for CCSDS will remain the same through 2003. In 2004, the funding source will change and money for standards development will come from the Science Enterprises.   The importance of Standards needs to be conveyed to the Enterprises to ensure appropriate funding levels.   Mission use of CCSDS will be presented to the Enterprises, so it is important that this information is up-to-date. The agencies were requested to review the CCSDS-compliant missions and products lists on www.ccsds.gst.com and provide updates (AI MC-S02-A03). Mr. Dowen also reported that NASA is developing a Test Bed at the Ames

Research Center that can test and compare data standards.   The NASA report is shown in Attachment I.

NASDA - Mr. Mikio Sawabe reported that NASDA has appointed a new delegate for CCSDS. The most recent CCSDS-compliant mission was ADEOS-II, launched in November 2002.   Six new NASDA ground stations will begin operations in June 2002.   The NASDA report is shown in Attachment J.

RSA - The RSA delegation did not attend and no report was submitted.

ISAS – Dr. Takahiro Yamada noted in his presentation that ISAS will most likely be using CCSDS TLM/TC for the new Planet-C mission (Venus orbiter) scheduled for launch in 2007. CCSDS-compatible ground stations will be using SLE RAF and F-CLTU for data transfer between ISAS and JPL for MUSES-C. Also, ISAS uses XML-based SLE Service Management for this project as a method of requesting services from JPL. ISAS is leading the Working Group for Spacecraft Monitor & Control and is also leading the development of a draft CCSDS Architecture document. The ISAS report is shown in Appendix K.

XI.   LIAISONS REPORT

There were no liaisons reports.

XII.   PANEL REPORTS

Panel 1 – Mr. Michel Morlon reported on the activities of Panel 1, the Sub-panels, and proposed resolutions.   Some of the highlights of the report include the proposal to split the Proximity-1 red book into three separate books that address the physical, coding, and data link layers (Resolution MC-02-3). Also, an annex will be added to the CCSDS File Delivery Protocol Blue book to support extended procedures for multi-hop operations (Resolution MC-02-17).   The Spring 2002 Sub-panel meetings were held at multiple ESA centers.   The Sub-panels and Panel 1 Plenary scheduled for fall 2002 in the US are being coordinated with the Houston World Space Congress event. Other Panel 1 proposed resolutions concerned *Space Packet Protocol-Encapsulation Service* Red Book (Resolution MC-02-1), pink sheets for *Telemetry Channel Coding* (Resolution MC-02-2), and pink sheets for *Radio Frequency and Modulation Systems* Blue Book (Resolutions MC-02-18 and -19). The Panel 1 report is shown in Attachment L.

Panel 2 – The Panel 2 report was presented by Dr. David Giaretta. Panel 2 did not have any resolutions to the MC. Work activities focused on XML since the panel believes that it will be very important for new standards development in CCSDS. It was also reported that OAIS has been widely implemented by many organizations. The Panel 2 report is shown in Attachment M.

Panel 3 - Mr. Maurice Winterholer presented the Panel 3 report. The current objectives for Panel 3 are to finalize the SLE Services Specification and the development and review of the SLE Service Management specification books.   The final versions of RAF and F-CLTU documents have received feedback on a JPL implementation and are ready for approval as Blue books (Resolutions MC-02-6 and -7). A new work item was proposed to develop a cross support tracking service (Resolution MC-02-10). Issues of concern are the problems of insufficient

manpower for all working groups and the lack of continuity of the chairmanship of WG5 (SLE Transfer Services API and Security).   The Panel 3 report is shown in Attachment N.

Concerning the NASA reprioritization proposal (see paragraph XIII), Mr. Winterholer stated that Panel 3 agrees on the need to reorganize their efforts and will respond to the proposed changes as RIDs. Panel 3 plans to continue the work and testing of the existing SLE Service Management specification and also develop, in the short-term, an SLE Service Management "Lite" book that would be user-friendly and have simplified requirements. These requirements would be technology-independent.   An XML specification of SLE-SM Lite will also be developed.

TSG - Mr. Drexler reported on the discussions from the TSG meeting.   The TSG has proposed to generate a CCSDS Architecture document using input from all the panels (Resolution MC-02-12).   The IOAG will be informed of this effort during the November 2002 meeting. A prototype for an operational framework for a distributed data system will be developed in parallel to support the Architecture document. This prototype will be based on XML and related technologies. The XML Working Group also presented their report and requests for manpower at the TSG meeting.   The TSG wanted to review this request, and study the relationship of XML to the Architecture development before making a final decision. In the meantime, the XML Working Group will continue their research (AI MC-S02-A06). The TSG report is shown in Attachment O.

It was also reported that ISAS is responsible for developing a draft Spacecraft Monitor and Control document and detailed work plan (AI MC-S02-A07).

Mr. Adrian Hooke stated that some organizations using IP for space data exchange are not aware that CCSDS has mature standards and implementations for this capability. In order to better communicate this capability, a resolution was proposed (Resolution MC-02-14) to recommend that space mission organizations use CCSDS Internet-in-Space recommendations and to provide feedback on their experiences. These recommendations will be transmitted by CCSDS to the organizations within the agencies who are responsible for the development of missions and the IOAG.

Security issues were discussed at the TSG meeting and it was proposed that all development of CCSDS Recommendations must include a security review. To assist the security reviews, a threat statement book and a risk analysis guide will be developed (Resolution MC-02-15). Security will also be included in the CCSDS Architecture.

XIII.   REPRIORITIZATION OF PANEL 3 WORK

Mr. Dowen reported that NASA has had discussions on the restructuring of the CCSDS panels. He stated that in the past Panel 3 has done a great job in the development of Recommendations. However, the SLE Recommendations for interoperability are developed from a provider point-of-view. NASA recommends that the focus be changed to that of the customer point-of-view. The effort should be concentrated on a limited set of cross-support services currently utilized by the agencies.   Concerning Transfer Services, NASA sees the need for F-CLTU, RAF and RCF, but does not see customers for FSP and OCF. In Service Management, Panel 3 should suspend its current work and refocus on developing concrete transfer syntax in XML for customer service requests. Overall, Panel 3 should reestablish itself as a systems panel by developing an end-to-

end systems architecture for CCSDS and customer service interfaces for new protocols. Additionally, Mr. Dowen suggested that the organization of CCSDS could be improved by discontinuing work on archiving standards since many NASA customers prefer alternatives.

To achieve consensus, the MC agreed that each agency should develop their own restructuring plan to improve the efficiency of CCSDS, increase the customer input to the standards development process, streamline the reporting process, and improve meeting scheduling (Resolution MC-02-4). Position papers from each Agency should be drafted by 15 July and a final discussion will be held at the Fall 2002 MC meeting (AI MC-S02-A04).

XIV.   SPACE OPS

Mr. Dowen stated that Space Ops is an international space flight operations association consisting of representatives from most of the space-faring nations. It was founded in 1990 to foster a technical interchange forum for discussing state-of-the-art technology. The conference is held on a biannual basis and is scheduled for 9-12 October 2002 in Houston, US. Hotel reservations should be made as soon as possible. Hotel reservations are available at the aiaa.org web site. Messrs. Drexler (DLR) and Kelley (NASA) are chairs for the Standardization and Enabling Technologies track. Cross Support and Interoperability track is chaired by Jim Costrell (NASA) and Geneviève Campan (CNES). A new CCSDS booth has been provided by JPL for this conference. Mr. Hooke stated that free items such as mouse-pads and posters that promote CCSDS are very popular, and the Agencies should provide these types of materials for the booth. Mr. Kelley added that the CCSDS 20th Anniversary would be scheduled to coincide with Space Ops.

XV.   PAKISTAN REQUEST FOR MEMBERSHIP

The request by Pakistan for CCSDS membership as an observer agency was approved (Resolution MC-02-16). The Secretariat will draft and send a welcoming letter.

XVI.   CHANGE IN MEMBERSHIP STATUS

According to CCSDS procedures, the Management Council should evaluate the membership status of its Members and Observers. The Canadian Space Agency (CSA) and the Russian Space Agency (RSA) are Member Agencies that do not participate in the panels and have been absent from the MC meetings. Ms. Linda Kezer stated that she received an email from TsNIIMash stating that they wish to remain as a member (although they officially are an Observer agency). It was also noted that the Communications Research Center (CRC) is a Canadian Observer agency that is active in Panel 1. The Secretariat will try to contact the representatives for RSA, TsNIIMash, and CSA to clarify their status and participation (AI MC-S02-A08).

XVII. SCHEDULING PROCEDURE

Mr. Kelley discussed the need to improve the scheduling and coordination of CCSDS meetings. A procedure was distributed prior to the meeting with the intention that this would become a standard operating procedure. Mr. Kaufeler suggested that a standard procedure for scheduling meetings should be included as part of the restructuring proposal (AI MC-S02-A05).

XVIII.   DOCUMENT CONTROL TABLE

Dr. Yamada stated that Green books are not being revised to coincide with the updates to associated Blue books. He proposed a Document Control Table to improve the tracking and management of the CCSDS documentation. The table would be completed whenever a Red book is proposed for approval. It was noted that the table should include a way to track security evaluations. This management tool was also requested to be included as part of the standard panel reporting format proposed at the TSG meeting.   The reporting format and document control table are shown in Attachment P. The Agencies are to provide their comments (AI MC-S02-A09). Mr. Drexler and Dr. Yamada will incorporate Agency comments and prepare a final version of a panel reporting format at the next MC meeting (AI MC-S02-A10).

XIX.   AWARDS NOMINATION COMMITTEE

Mr. Kelley and Dr. Allan will participate in an Award Nomination Committee to honor CCSDS members at the 20th Anniversary Plenary. All Agencies are requested to provide nominations for the awards (AI MC-S02-A11).

XX.   SPACE ACTIVITIES - WORLD WIDE LAB

Mr. Hooke presented the Space Activities World Wide Lab concept. This concept uses emerging technologies to facilitate "pre-space" mission activities such as testing, simulation, training, etc. The emerging technologies include Virtual Private Networks, virtual meetings and multi-conferencing, and remote collaborative tools.   The aggregation of these technologies creates the World Wide Lab virtual environment. Mr. Hooke recommended that these capabilities could be used by CCSDS and for the Mars exploration program that involves multiple space agencies. Additionally, CCSDS should consider a demonstration at the meetings in Houston. The World Wide Lab presentation is shown in Attachment Q.

XXI.   FUTURE MEETINGS

The following schedule was determined for the Fall 2002 meetings in Houston, US:

Panel Meetings:	30 September - 8 October (am)
TSG:	8 October (pm) CCSDS Dinner (evening)
CCSDS Plenary and Space Ops opening:	9 October
Space Ops:	10-12 October
MC:	14 October (pm)
MC/SC13:	15 October

It was proposed that the Spring 2003 meetings will be hosted by ASI. ASI will confirm their availability.

The Fall 2003 meetings will be hosted by NASA in the US.

The Spring 2004 meetings will be hosted by ESA.

XXII. RESOLUTIONS AND ACTION ITEMS

The resolutions and actions items were read and approved.

XXIII. ADJOURN

Mr. Kelley adjourned the Management Council meeting.

CCSDS Management Council
Draft Resolutions
18 April 2002

MC-S02-1. The CCSDS resolves to publish CCSDS 133.1-R-1: *Space Packet Protocol - Encapsulation Service* as a Red Book.

MC-S02-2. The CCSDS resolves to publish the pink sheets for CCSDS 101.0-P-5.1: *Telemetry Channel Coding*.

MC-S02-3. The CCSDS resolves to support Subpanels P1A, P1B, and P1E joint proposal consisting in splitting CCSDS 211.0-R-3: *Proximity-1 Space Link Protocol* into 3 separate books corresponding respectively to physical, coding and data link layers.

MC-S02-4. The CCSDS resolves to take action to restructure CCSDS.

MC-S02-5. The CCSDS resolves to approve the Panel 3 SLE-Service Management reorientation proposal.

MC-S02-6. The CCSDS resolves to approve CCSDS 911.1-B-1: *Space Link Extension - Return All Frames Service Specification* as a Blue Book. This document will also be progressed to ISO TC 20/SC13.

MC-S02-7. The CCSDS resolves to approve CCSDS 912.1-B-1: *Space Link Extension - Forward CLTU Service Specification* as a Blue Book. This document will be progressed to ISO TC 20/SC13.

MC-S02-8. The CCSDS resolves to approve CCSDS 910.0-Y-1: *Space Link Extension Services - Executive Summary* as a Yellow book.

MC-S02-9. The CCSDS resolves to approve CCSDS 910.3-G-2 *Cross Support Concept - Part 1: Space Link Extension Services* as a revised Green Book.

MC-S02-10. The CCSDS resolves to approve New Work Item "Tracking Service" for Panel 3.

MC-S02-11. The CCSDS resolves to approve the provision of support from Agencies for manpower and confirmation of WG chairs for Panel 3.

MC-S02-12. The CCSDS resolves to appoint Dr. Yamada as chairman of a special TSG working group to create a draft CCSDS architecture document and requests that the Agencies allocate the necessary resources to support this activity.

MC-S02-13. The CCSDS resolves to appoint Dr. Yamada as chairman of a special TSG working group for the spacecraft monitoring and control work package.

MC-S02-14. The CCSDS resolves that:

- The space mission organizations within the Agencies who wish to implement "Internet-in-Space" capabilities should use the existing standard CCSDS capabilities and should feed back flight experience to CCSDS.

- The organizations within the Agencies who provide multi-mission support infrastructure should implement the standard CCSDS "Internet-in-Space" capabilities when such requirements emerge.

- These recommendations will be transmitted by CCSDS Principal Delegates to the organizations within the Agencies who are responsible for the development of missions and their supporting infrastructure.

MC-S02-15. The CCSDS resolves to accept the Security recommendation of the TSG to proceed with the following and requests that the Agencies allocate the necessary resources to support this activity.

- Develop a CCSDS threat statement book.

- Develop a mission planner threat/risk analysis guide.

- Develop a CCSDS security architecture.

MC-S02-16. The CCSDS resolves to approve the request from the Pakistan Space & Upper Atmosphere Research Commission to become an Observer Agency.

MC-S02-17. The CCSDS resolves to approve pink sheets for CCSDS 727.0-P-1.1: *CCSDS File Delivery Protocol (CFDP)*.

MC-S02-18. The CCSDS resolves to approve pink sheets for the following P1E Recommendations for agency review:

2.4.3 *Subcarriers in Low Bit Rate Residual Carrier Telemetry Systems*.

2.6.7B *Transponder Turnaround Frequency Ratios for the 7145-7190 MHZ and 31.8-32.3 GHz Bands*

3.1.6.B *Channel Frequency Plan for 2, 7, 8, 32, and 34 GHz*

MC-S02-19. The CCSDS resolves to delete the following P1E Recommendations and replace with revised 2.4.3:

2.4.4 *PSK Modulation for Telemetry Subcarriers*

2.4.5 *Telemetry Subcarrier Waveforms*

3.3.4 *Use of Subcarriers on Spacecraft Telemetry Channels*

MC-S02-20. The CCSDS thanks DLR for providing excellent facilities and efficient logistical support, and for being a most gracious host for the Spring 2002 meetings.

CCSDS Management Actions
Draft Action Items
18 April 2002

MC-S02-A01. Provide comments on the new CCSDS web site to the Secretariat. Address is http://secretariat.gst.com. Comments should be submitted using the on-line Questions/Comments form located at the bottom of the web pages.

> Actionee: All Agencies
> Due Date: 15 June 2002

MC-S02-A02. The Secretariat will produce an advertisement and an article about CCSDS that are suitable for submittal to trade or Agency publications. These items will be provided to all Agencies as a template.

> Actionee: Secretariat
> Due Date: 15 June 2002

MC-S02-A03. Agencies should review current list of CCSDS missions and products at http://secretariat.gst.com/implementations/implementation.html and provide updates.

> Actionee: All Agencies
> Due Date: 20 May 2002

MC-S02-A04. Each Agency shall provide a position paper on restructuring of the CCSDS panels to the Secretariat. The goal of a proposed restructuring would be to improve the standards development process and to refocus efforts to that of a customer perspective. All restructuring proposals will be discussed at the next MC meeting

> Actionee: All Agencies
> Due Date: 15 July 2002

MC-S02-A05. Provide comments to the Secretariat on the policy for scheduling CCSDS meetings in conjunction with the comments on the restructuring.

> Actionee: All Agencies
> Due Date: 15 July 2002

MC-S02-A06. The TSG should continue work on the XML Working Group subject and provide a recommendation to the members of the MC.

> Actionee: TSG
> Due Date: 15 May 2002

MC-S02-A07. Provide a draft S/C Monitoring and Control work package to the TSG and then present to the MC at the Fall 2002 meeting.

        Actionee: ISAS
        Due Date: 1 August 2002

MC-S02-A08. Verify whether TsNIIMash replaces RSA as member agency. Also, send a letter to CSA as to whether they want to continue as a member agency.

        Actionee: Secretariat
        Due Date: 15 May 2002

MC-S02-A09. All Agencies should submit comments to Dr. Yamada and Mr. Drexler regarding the panel reporting format, including the proposed Document Control Table.

        Actionee: All Agencies
        Due Date: 1 June 2002

MC-S02-A10. Mr. Drexler and Dr. Yamada will incorporate Agency comments and prepare a final version of a panel reporting format at the next MC meeting.

        Actionee: DLR and ISAS
        Due Date: 14 October 2002

MC-S02-A11. Agencies should provide nominees for awards to be presented at the 20th Anniversary to the Secretariat for consideration.

        Actionee: All Agencies
        Due Date: 1 August 2002

ATTACHMENT A.

MEETING AGENDA

DRAFT CCSDS MANAGEMENT COUNCIL
AGENDA
DLR, Germany
18-19 April 2002

1. Call to Order (0900, 18 April 2002)

2. Introduction of Delegates

3. Welcoming Remarks

4. Agenda Review and Approval

5. Review of Minutes from June 2001 Meeting in Oxfordshire, England

6. Secretariat Report

    –   Action Item Status

    –   Document Status

    –   Proposed New Web Site

    –   Outreach/Promotional

7. Agency Reports (Include ManYears of effort and potential resource issues)

8. Report from Liaisons & Review of Liaison Relationships

9. Summary Reports from Technical Panels (Reports should be limited to the following: a) Proposed Resolutions, b) Issues requiring MC approval/action).

    –   Panel 1

    –   Panel 2

    –   Panel 3

    –   TSG

        •   Discussion of Proposed Revisions to CCSDS Strategic and Operations Plans

10. Special Topics:

    –   Report on 20th Anniversary Planning

        •   Standards & Enabling Technologies Session

        •   CCSDS Plenary at SpaceOps

        •   CCSDS booth

11. Any New Business

    –   New Scheduling Procedure

    –   Decision re Absentee Members (Russia, CSA)

    –   NASA Recommendation re P3 future program

    –   Document Status Table

    –   Award Nomination Committee

    –   Pakistan space agency request for participation as Observer

12. Planning for next Management Council meetings

13. Approval of Resolutions/Action Items

14. Adjourn

ATTACHMENT B.

PREVIOUS ACTION ITEM STATUS

ACTION ITEMS
CCSDS Management Council Meeting
June 6-7, 2001

The following new action items were established at this meeting:

S01-A01   In response to request by the IOAG, provide a work plan and issues for the Radio
                Metric and Orbit Data standard.
Actionee: TSG/Panel P1J
Due Date: November 2001
Status: **Closed**

                Response: In CY 2001 P1J completed a GB: Navigation Definitions and
                Conventions, and a RB: Orbit Data Messages. The answer to MC action item
                S01-A01, pertaining to orbit data, is satisfied with the information in these
                documents.   The recommendation on tracking (radio metric) data is a future work
                item. The first draft WB will be available in the Fall 2002.

                The Red Book for orbit data messages is scheduled for an agency wide review,
                following the Spring 2002 meeting, in preparation to request authorization to
                become a BB.

S01-A02   Each Agency should provide brochures, etc., for distribution at the 20th
                Anniversary session. Coordinate with DLR/Mr. Drexler and NASA/Mr. Kelley.
Actionee: All Agencies
Due Date: Spring 2002
Status: **Open**

S01-A03   Contact Liaison organizations to reconfirm interest.
Actionee: Secretariat
Due Date: November 2001
Status: **Open**

ATTACHMENT C.

DOCUMENT STATUS

CCSDS DOCUMENTS with STATUS COMMENTS	CCSDS DATE	CCSDS NUMBER	ISO Number	CCSDS /ISO Comment or ISO DATE
Telemetry Summary of Concept and Rationale` (Needs update)	87-12	100.0-G-1	N/A	N/A
Telemetry Channel Coding – Added Turbo Codes Corrected diagrams, added code options and Frame length	01-10	101.0-B-5	ISO 11754	**DIS voting begins 02-02-07; ends 02-07-07**
Packet Telemetry – Revised to include Internet Packets --- 08-00	00-10	102.0-B-5	ISO 13419	**DIS voting begins 02-02-31; ends 02-06-30**
Packet Telemetry Services – Initial Release Add IP Packet Services	01-10	103.0-B-2	ISO 17433	**DIS voting begins 02-02-07; ends 02-07-07**
Lossless Data Compression -	97-05	120.0-G-1	N/A	N/A
Lossless Data Compression	97-05	121.0-B-1	ISO 15887	Published 00-10
Lossy Data Compression (ESA is to write a draft White Book)		Green Book		
Lossy Data Compression (Compression algorithms still being evaluated)				Still needs to select the compression algorithm
Overview of Space Link Protocols	01-06	130.0-G-1	N/A	
Channel Coding and Synch Part 1 (Synchronous)	00-06	131.0-R-1	AWI 22641	
TM Space Data Link Protocol	**01-12**	**132.0-R-1**	AWI 22645	**RB Review 01-12-20 to 02-03-22**
Space Packet Protocol	**01-12**	**133.0-R-1**	AWI 22646	**RB Review 01-12-20 to 02-03-22**
Space Link Identifiers	**02-01**	**135.0-B-1**	AWI 22647	**BB Released 02-03-20**

CCSDS DOCUMENTS with STATUS COMMENTS	CCSDS DATE	CCSDS NUMBER	ISO Number	CCSDS /ISO Comment or ISO DATE
Telecommand Summary of Concept and Rationale (Being upgraded within CCSDS)	87-01	200.0-G-6	N/A	
20Telecommand Part 1 — Channel Service Modified to reduce Codeblock Length options	00-06	201.0-B-3	ISO 12171	**FDIS approved for publication**
Telecommand Part 2 — Data Routing Service Upgraded to carry SCPS-NP&IP Packets in CCSDS frame	01-10	202.0-B-3	ISO 12172	**DIS voting begins 02-02-07; ends 02-07-07**
Telecommand Part 2.1 — Command Operation Procedures Correct Gaps in States Matrices	01-10	202.1-B-2	ISO 12173	**DIS voting begins 02-02-07; ends 02-07-07**
Telecommand Part 3 — Data Management Service Upgraded to carry SCPS-NP&IP packets in CCSDS frame	01-10	203.0-B-2	ISO 12174	**DIS voting begins 02-02-07; ends 02-07-07**
Proximity-1 Space Link Protocol	02-01	211.0-R-3	AWI 22663	**RB review 02-01-25 to 02-04-01**
Channel Coding and Synch Part 2 (Asynchronous)	01-06	231.0-R-1	AWI 22642	
TC Space Data Link Protocol	**01-12**	**232.0-R-1**	AWI 22664	**RB Review 01-12-20 to 02-03-22**
Communications Operations Procedure 1	01-06	232.1-R-1	AWI 22667	
Time Code Formats (Reconfirmed for five years 96-06) (To have increased resolution in non-segmented Time Code)	**02-02**	**301.0-B-3**	ISO 11104	Reconfirmed 1996 **Update released 02-03-22**
CCSDS GSCID Field Code Assignment Control Procedures	99-05	320.0-B-2	Not applicable	Decision made to not progress document
The Application of CCSDS Protocols to Secure Systems	99-03	350.0-G-1	N/A	N/A
Radio Frequency and Modulation Systems—P1: Earth Stations and SC	01-06	401.0-B	N/A	Not sent to ISO

CCSDS DOCUMENTS with STATUS COMMENTS	CCSDS DATE	CCSDS NUMBER	ISO Number	CCSDS /ISO Comment or ISO DATE
Radio Frequency and Modulation Systems – Earth Stations	97-05	411.0-G-3	N/A	N/A
Radio Frequency and Modulation	92-05	412-0-G-1	N/A	N/A
Bandwidth Efficient Modulation	01-06	413.0-G-1	N/A	Not released
Navigation Data; Definitions and Conventions (Released with 502.0-R-1 in July 01)	01-06	500.0-G-1	N/A	N/A
Radio Metric and Orbit Data (Document being updated within CCSDS - exists as draft WB)	87-01	501 0-B-1	ISO 11103	Reconfirmed - 1996
Orbit Data Messages (Released as RB 01-07)	01-06	502.0-R-1	AWI 22644	Decision made to not progress RB-1 to ISO
Radio Metric and Orbit Data (Under Development)		Green Book		
Space Data Systems Operations with SFDUs	87-02	610.0-G-5	N/A	N/A
Standard Formatted Data Units—Structure and Construction Rules (Reconfirm for five years 99-06) (Corrigendum 1 to Document)	92-05 96-11	620.0-B-2 620.0-B-2/Cor 1	ISO 12175	1994
Standard Formatted Data Units – A Tutorial	92-05	621.0-G-1	N/A	N/A
Standard Formatted Data Units — Referencing environment	97-05	622.0-B-1	ISO 15888	
Standard Formatted Data Units — Control Authority Procedures (Reconfirmed for five years 99-06)	93-06	630.0-B-1	ISO 13764	96-12
Standard Formatted Data Units - Control Authority Procedures Tutorial	94-11	631.0-G-2	N/A	N/A
Standard Formatted Data Units - Control Authority Data Structures	94-11	632.0-B-1	ISO 15395	98-03
Parameter Value Language, A Tutorial	00-07	641.0-G-2	N/A	N/A
Parameter Value Language Specification (CCSD0006) (Document Updated 00-06)	00-06	641.0-B-2	ISO 14961	**Final proof received and approved.**
Language Usage in Information Interchange – Tutorial	98-10	642.0-G-1	N/A	N/A

CCSDS DOCUMENTS with STATUS COMMENTS	CCSDS DATE	CCSDS NUMBER	ISO Number	CCSDS /ISO Comment or ISO DATE
ASCII Encoded English (CCSD0002) (Reconfirmed for five years 99-05)	92-11	643.0-B-1	ISO 14962	97-12 Reconfirmed for 5 years until 04-08
Data Description Language EAST Specification Upgraded to included EAST extensions --- 00-08	00-11	644.0-B-2	**ISO 15889**	**DIS voting begins 02-04-11; ends 02-09-11**
The Data Description Language EAST– A Tutorial	97-05	645.0-G-1	**N/A**	N/A
Data Description Language EAST – List of Conventions	97/05	646.0-G-1	**N/A**	N/A
Data Entity Dictionary Specification Language (DEDSL) Abstract Syntax	01-06	647.1-B-1	**DIS 21961**	**DIS voting begins 02-04-11; ends 02-09-11**
Data Entity Dictionary Specification Language (DEDSL) PVL Syntax	01-06	647.2-B-1	**DIS 21962**	**DIS voting begins 02-04-11; ends 02-09-11**
Data Entity Dictionary Specification Language (DEDSL) XML Syntax	01-06	647.3-R-1	**DIS 22643**	**DIS voting begins 02-02-07; ends 02-07-07**
Reference Model for an OAIS (RB-2 prepared from received-RID comments now out for second review, no significant technical changes, just reorganized)	01-07	650.0-R-2	DIS 14721.2	**DIS balloting complete; 100% approval** **BB being prepared for release.**
AOS: Networks and Data Links – Summary of Concept, Rationale and Performance	92-11	700.0-G-3	N/A	N/A
AOS: Networks and Data Links: Architectural Specification (Upgraded to include Internet Packets)	01-10	701.0-B-3	ISO 13420	**DIS voting begins 02-02-07; ends 02-07-07**
AOS: Networks and Data Links – Audio, Video and Still-Image Communications Services	94-05	704.0-G-3	N/A	N/A
Space Communications Protocol Spec-Network Protocol (SCPS-NP) (Pink Sheet Pending re Handling IP Packets)	99-09	713.0-B-1	ISO 15891	Published 00-10

CCSDS DOCUMENTS with STATUS COMMENTS	CCSDS DATE	CCSDS NUMBER	ISO Number	CCSDS /ISO Comment or ISO DATE
Space Communications Protocol Spec -Security Protocol (SCPS-SP)	99-05	713.5-B-1	DIS 15892	Published 00-10
Space Communications Protocol Spec-Transport Protocol (SCPS-TP)	99-05	714.0-B-1	ISO 15893	Published 00-10
Space Communications Protocol Spec-File Protocol (SCPS-FP)	99-05	717.0-B-1	DIS 15894	Published 00-10
CCSDS File Delivery Protocol (CFDP), Introduction and Overview	**02-01**	**720.1-G-1**	N/A	N/A
CCSDS File Delivery Protocol (CFDP), Implementers Guide	**02-01**	**720.2-G-1**	N/A	N/A
CCSDS File Delivery Protocol (CFDP)	**02-01**	**727.0-B-1**	DIS 17355	**Voting begins 02-01-24; ends 02-06-24**
AOS Space Data Link Protocol	**01-12**	**732.0-R-1**	AWI 22666	**RB Review 01-12-20 to 02-03-22**
Standard Terminology, Conventions and Methodology (TCM) for Defining Data Services	94-11	910.2-G-1	N/A	N/A
Cross Support Concepts, Part 1 Space Link Extension Services	95-05	910.3-G-1	N/A	N/A
Cross Support Reference Model Part 1: Space Link Extension Services	96-05	910.4-B-1	ISO 15396	98-05
SLE Service Management Specification	**01-09**	**910.5-R-2**	AWI 22668	**RB Review 01-10-26 to 02-03-15**
SLE Service Management Specification - Space Link Physical Layer Managed Object Specification	**01-10**	**910.7-R-1**		**RB Review 01-10-26 to 02-03-15**
Space Link Extension – Return All Frames Service Specification	00-11	911.1-R-2	AWI 22669	
Space Link Extension-Return Channel Frame Service Specification	01-06	911.2-R-2	AWI 22670	
Space Link Extension – Forward CLTU	00-02	912.1-R-2	AWI 22671	
Space Link Extension – Forward Space Packet	01-06	912.3-R-2	AWI 22672	

ADMINISTRATION DOCUMENT/COMMENT	CCSDS DATE	CCSDS NUMBER	ISO Number	ISO Date
CCSDS Procedures Manual	01-01	A00.0-Y-7.4	N/A	N/A
CCSDS Strategic Plan	99-12	A01.1-B-1	N/A	N/A
CCSDS Operating Plan	99-12	A01.2-B-1	N/A	N/A
CCSDS Achievements and Products	95-04	A10.0-Y-5	N/A	N/A
CCSDS Leaflet	98-06	A10.1-Y-3	N/A	N/A
CCSDS Related Implementations	96-11	A12.0-G-1	N/A	N/A
CCSDS Glossary	97-07	A30.0-G-3	N/A	N/A
Unique Identification of CCSDS Objects and Services	00-07	A31.0-Y-1	N/A	N/A
Proceeding of the CCSDS RF and Modulation Sub-Panel May 01 Meeting Concerning Bandwidth Efficient Modulation	02-03	B20.0-Y-1	N/A	Expect release soon

OBSOLETED DOCUMENTS	CCSDS Date	CCSDS Number	ISO Number	ISO Date
Advanced Orbiting Systems, Networks and Data Links: Abstract Data Type Library—Addendum to CCSDS 701.0-B-2	94-05	705.1-B-1	Not Applicable	Did not progress to ISO
Decision made to render document obsolete – 99-05				
Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the Path Service and Protocol—Addendum to CCSDS 701.0-B-2	94-05	705.2-B-1	Not Applicable	Did not progress to ISO
Decision made to render document obsolete – 99-05				
Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the VCLC Service and Protocol—Addendum to CCSDS 701.0-B-2	94-05	705.3-B-1	Not Applicable	Did not progress to ISO
Decision made to render document obsolete – 99-05				
Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the VCA Service and Protocol—Addendum to CCSDS 701.0-B-2	94-05	705.4-B-1	Not applicable	Did not progress to ISO
Decision made to render document obsolete – 99-05				
Advanced Orbiting Systems, Networks and Data Links; Audio, Video and Still-Image Communications Services	94-05	704.0-B-1	ISO 15890	MC Decision to Obsolete Document 00-10

ATTACHMENT D.

ASI REPORT

ASI report to the CCSDS Management Council

In November 2001, Prof. Sergio Vetrella was appointed as ASI President. Currently, the new President has started the complete revision of the National Space Plan, which includes all the policies and programs for the next 5 years. The new plan will be submitted to the Italian Government within the end of May 2002.

Funding and ASI participation to space programs shall be finalized within this plan. The new plan shall also determine ASI participation to the CCSDS panel activities.

ASI has only recently started to participate in CCSDS panels. The first Panel was the P1A, where industrial support (from Alenia Spazio) was allocated in the framework of the Proximity Link protocol. ASI plans to participate in additional panels, and the organization for this participation is still in progress. A contract for industrial support is still in preparation, and in total a 2.5 man-year support is foreseen. This contract is now under revision by the ASI Legal and Contract Office, and will be finalized according to the new National Space Plan.

The use of CCSDS recommendations for ASI Programmes is increasing. New programmes shall, as far as possible, adhere to SL recommendation and SLE. As an example, consider the Malindi Ground Station, currently used for the control of SAX satellite which is planned to end its operational lifetime by the end of April; this will be updated for new missions applying CCSDS recommendations as far as possible.

ATTACHMENT E.

BNSC REPORT

BNSC

BRITISH NATIONAL SPACE CENTRE

BNSC REPORT TO THE CCSDS MANAGEMENT COUNCIL

18 APRIL 2002

CLRC

BNSC Report to the CCSDS Management Council 18 April 2002

CCSDS recommendations and their associated ISO and BSi standards continue to have a great deal of importance within the BNSC programmes and we maintain our support to the CCSDS Panels, the TSG and the MC. The BNSC resources are managed under contract by QinetiQ (formerly DERA). Overall BNSC staff levels for this work have been approximately 2 staff years per year, including industrial support. During the last year, the mechanism for funding panel activities changed, with panel 1 activities being removed from the previous contract. Unfortunately, due to a change of personnel at BNSC, this resulted in no initial funds for panel 1 support, although this was rectified later in the year. BNSC are currently re-evaluating the mechanism by which they support all standards activities and this includes CCSDS activities. However, this should not result in a reduction in support for support of CCSDS overall.

BNSC has taken particular interest in Security, prototyping SLE services, Archiving standards, exploiting XML, and Interoperability.

Panel 1

Due to the hiatus in the funding for panel 1 activities, there has been little progress in this area during the last year. However, we do retain a strong interest in security issues and we hope to be able to fund these in the financial year just started.

Panel 2

BNSC continues to provide the Panel 2 chairman plus one other active member of this panel. Thus we have contributed to the books for the Archive Reference Model and the DEDSL together with work towards new standards flowing from the archive reference model such as Data Ingestion. The Archive Reference Model is now a Blue Book.

We taken a great interest in the XML activities, both for their use within CCSDS, and also as a bridge to other work in which we are involved that is planning to use XML. Notable in this area is the development of XML-related data models for use in astronomy and in the use of web and grid services in building a virtual observatory for astronomers.

Panel 3

Vega has continued to be active in implementing a prototype SLE system that includes transfer services and service management. The user interface has been improved so that it is no longer necessary to specify individual parameters for each spacecraft by walking up and down a hierarchical set of menus. Previously this was usable, but took an annoying amount of time to set up.

The SLE software products are currently in use at the QinetiQ ground station at West Freugh in Scotland. In the coming months, we intend to install the same software at RAL and to use it to increase the co-operative efforts that have been taking place over the last year between RAL and QinetiQ. The initial phase of this co-operation occurred when RAL supported the ill-fated STRV-1c/d satellites between the time when QinetiQ could no longer track them due to other commitments, and the time when they were formally declared to be irrecoverable. We intend to use the SLE software both in providing backup facilities for each other, and in responding to opportunities from CSOC.

Presentations at Meetings

A meeting on Digital Archives was organized by Neil Beagrie and David Giaretta and held on 19 October 2001 in London. This meeting discussed the development of a wide range of types of digital archives, not just those dealing with space, but it was called to discuss the wide interest shown in the OAIS reference model outside the space community.

There have also been presentations at Xspace and other XML related meetings.

ACE and STRV

The RAL S Band ground station has now provided telemetry capture support to the Advanced Composition Explorer (ACE) mission for over four years. This has shown the reliability and good performance achievable with the CCSDS compatible AVTEC decoder system which provides bit synchronization, Viterbi decoding, frame synchronization and Reed Solomon error correction before automatically sending the telemetry frames to the Space Environment Center at Boulder. A near real-time display of the data can be obtained from Boulder at
http://www.sec.noaa.gov/ace/MAG_SWEPAM_24h.html

RAL is currently evaluating a package provided by NOAA that will do the CCSDS packet telemetry handling on a standard PC running Linux. If this is successful, we will use it in our normal operational environment.

P. Allan, 18 April 2002

ATTACHMENT F.

CNES REPORT

CNES REPORT
CCSDS MANAGEMENT COUNCIL
MUNICH - APRIL 2002

1- <u>POTENTIAL INVOLVED</u> :

CNES manpower involved in CCSDS activities is still constant, to about 3 man x year.

CNES continues providing chairmanship of Panel 3

2- <u>NEW IMPLEMENTATIONS / PRESENTATIONS</u> :

Recapitulation of satellites / launchers, compliant with CCSDS for TLM and CMD :   Ariane
Proteus family : Jason, Calypso, Corot, SMOS, Mégha Tropiques
Myriades family : Demeter, Franco-Bresilian, Parasol,
                                    Microscope,   Roue Interféromètrique,
                                    Picard
Pléiades
Mars Premier

To ensure good interoperability between CNES future deep space station and NASA/JPL or ESOC and between Mars Premier CC and the previous agencies,
   - SLE Transfer Services (Return All Frames; Return Virtual Channel; Forward CLTU)
   - OPM / EPM
will be adopted

Activities connected to the OAIS reference model :
- Conferences about OAIS have been made at different meetings.
- CNES organizes from 5 to 7 november at Toulouse a meeting "Ensuring long term preservation and adding value to scientific and technical data"
- Creation of a user's club dealing with long term preservation (http://sads.cnes.fr:8010/pin/welcome.html), with CEA, Airbus, CNRS,…

Activities connected to EAST data description language :
After data from the CDPP (Plasma Physic Center), EAST is now used on an operational basis for Helios and Jason data and in a near future for Envisat data.

Activities connected to Data Dictionary Specification Language (DEDSL) :
DEDSL are used for ATV-CC, Helios and CDPP, in order to describe interfaces between subsystems.

3- <u>CNES ACTIVITIES INTO PANELS :</u>

CNES experts are involved into most of the panels; exception is P1K (Standardization of on-board interfaces). The following could be outlined :

P1A : Participation to the work on the data link layer, mainly :
-modifications proposals concerning interleaving depth and frame lenght, issued from codes evolution
-recommendation concerning proximity links (new red book version)

P1B : Participation to the work concerning channel coding, mainly
-comparative performance of new codes for high bit rate and narrow band

P1C : Participation to comparison between image lossely compression algorithms; tradeoff between proposals.

P1F : Analysis of blue book draft concerning CFDP

P1E : No new activity

P1J : Participation to red book standardizing exchange of navigation data; CNES is also in charge of the draft of a red book concerning exchange of attitude data.

P1K : No participation

P2 : Participation to the review of Data Entity Dictionary Specification Language-XML/DTD Syntax as red book.

P3 : -Work has been mainly concentrated on a SLE Management bundle (Svcs Mgmt-red, Space link Physical layer-red, Green book, Brochure), to release it for agencies review
-Also, participation to production of books concering:
-SLE Transfer services (RAF, RCF, CLTU, FSP- red)
-Development of API recommendations for implementations of Transfer services over TCP/IP (Core specification, API-Return Svcs, API-Forward Svcs,…-white)

ATTACHMENT G.

ESA REPORT

Report of ESA delegation
To the CCSDS Management Council
April 2002

General:

ESA took the opportunity of TTC 2001 Workshop, organized at ESTEC from 29th to 31st November, to propose to host various P1 sub-panels meetings in Europe. Unfortunately, after the horrible attack from 11th September in New York, agencies have suffered from travel restrictions and, as a consequence, sub-panel P1E and P1F meetings planned in ESA establishments have been cancelled. Nevertheless, sub-panels P1A, P1B and P1C meetings took place at ESRIN and sub-panels P1J and P1K at ESTEC, as planned, the second week of November. On 1st and 2nd November, ESTEC hosted a P1A+E joint meeting and a P1 working session on specific TSG topics. After number of iterations within P1, ESA proposed to host all P1 sub-panel meetings, during week April 8-12, P1E at ESA HQ, April 8-10, and other sub-panels, plenary and joint meetings, at ESOC Darmstadt.

ESA is pleased to note the significant progress achieved since 2001 spring meetings, in spite the dramatic circumstances, which have limited the possibility of fall 2001 meetings.

Support by ESA to CCSDS panel work:

ESA continues to be committed to support actively all panels, sub-panels and working groups of CCSDS. ESA is directly involved in the production and review of all major books. Several key players from ESA within the CCSDS technical management (panel 1 and P1B, P1E, P1K sub-panel chairs) keep ensuring that technical progress is maintained.
Presently, approximately 15 ESA staff members are directly involved in preparation of CCSDS recommendations, corresponding to a yearly effort of about 5 man-years, in addition to the contracted work.
The implementation and testing activities of systems linked to CCSDS recommendations (as e.g. SLE and CFDP) constitute also a significant level of resources.
These activities are further supported by studies directly covering CCSDS subjects and preparation of recommendations. These studies include work on efficient modulation schemes, on turbo codes, on SLE service provider implementation and service management, on data decompression libraries, on XML packaging for space data, on validation of CCSDS recommendations (COP, CFDP), and on performance assessment of links using COTS IP technology.
As a member of OMG, ESA is involved in the activity of the Space Domain Task Force (SDTF).
ESA also organized on 5-6th December 2001 at ESOC an international XML Workshop, which has been a very efficient and successful forum for CCSDS experts in the field.

Implementations of CCSDS recommendations:

ESA is actively continuing its policy to implement CCSDS recommendations. As stated several times, ESA's standardisation plan foresees the application of CCSDS recommendations for basically all future missions in the area of Space Data Communications and consequently, the ground infrastructure is being upgraded to support the corresponding needs. Currently, the ground infrastructure is capable to support CCSDS compatible missions up to the link layer (i.e. including packet TM/TC). Present and future implementations (e.g. INTEGRAL, ROSETTA, MARS-EXPRESS) cover and will cover progressively SLE services and higher layers.
ESA continues to work on development of space data systems standards within the ECSS system, essentially based on CCSDS recommendations; Packet Utilisation Standard (PUS) review is under completion.
ESA has organised the TTC 2001 workshop at ESTEC end of October 2001, in which a large place has been given to communications related to CCSDS standards and applications (efficient modulation, on board interfaces, turbo codes, SLE services, CFDP, Proximity links).

Observations to work of technical panels:

Considering the limits on available resources for standardisation work, ESA notes with satisfaction that considerable progress was achieved in nearly all areas and many agreements could be reached.
After an intense and fruitful testing process in cooperation with other agencies, a blue book containing core recommendations for the CCSDS File Delivery Protocol (CFDP) is under issue. An informative annex to that Blue Book describes extended procedures presently considered for ESA applications. ESA would like to see a set of those extended procedures becoming blue in September 2002 after their validation by testing, in particular the "Multiple Serial Way Points". In parallel ESA is considering favorably the NASA proposal to allocate work resources for definition of "Space Internet" architecture.
ESA supports the effort currently made in the CCSDS to facilitate the access of the users to the standards by a new set of documents (e.g. new green books, application profiles, etc.)
The review of SLE services management Red Books has revealed some difficulties within ESA to consider using such very detailed and complex recommendations for an expected limited requirement for control of Agencies facilities by foreign users.

ATTACHMENT H.

INPE REPORT

INPE Report
to the
CCSDS Management Council
DLR, Oberpfaffenhofen, Germany
18-19 April, 2002

INPE wishes to reaffirm its continuing support as a Member of the Consultative Committee for Space Data Systems.

INPE had a new Director pointed by the Ministry of Science and Technology, by September and who formally took his office by November 2001.

By 15 of March 2002 the new Director was forced to enforce a cut of 57% in INPE's previous budget for 2002, for compliance with budgetary cuts adopted by the Ministry of Science and Technology. Due to this restriction in resources, INPE could not be represented, inclusive, at this CCSDS Management Council meeting, as justified by the Director, directly to his Principal Delegate to CCSDS.

INPE continues in its effort for sustaining technical experts associated to most of the CCSDS (Sub-)Panels, basically, under the same level and intensity as declared in INPE's report to the CCSDS MC meeting, as presented at RAL/BNSC, in Chilton, in June 2001. So far, this participation with each (Sub-)Panel technical work is limited to the electronic mail follow up and, when required, it includes the technical review of documents related to the development of the work being executed by the many panels and subpanels (Red Books, Draft Green Books, etc.). It has not yet been possible to obtain financial resources for effective participation of some of the experts in the CCSDS Panel/Subpanel meetings. Nevertheless, there is a continuing determination for concrete, gradual realization of this objective, from a first opportunity on, in the future.

EDUARDO W. BERGAMINI
INPE Principal Delegate to CCSDS
('in absentia' to the meeting)

Sao Jose dos Campos, April 2002

ATTACHMENT I.

NASA REPORT

• NASA DATA SYSTEMS STANDARDS REPORT •

NASA Data Systems Standards Program (NDSSP)

A Status Presentation to the
CCSDS Management Council
April 18, 2002

Jack Kelley		Andrew Z. Dowen
Program Executive	**and**	NDSS Program Manager
202/358-0197		818/354-8191
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April 18, 2002
NASA / MC

• NASA DATA SYSTEMS STANDARDS REPORT •

AGENDA

- Restructuring Within NASA
- NDSS Programmatic Environment
- New Budget Focus and Approach
- CCSDS Work In Progress Within US
  - Within NASA
  - External to NASA
- Items of General Interest to MC
  - Accomplishments to Date

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April 18, 2002
NASA / MC

• **NASA DATA SYSTEMS STANDARDS REPORT** •

Restructuring

- ◆ **Following SOMO's cancellation, Data Standards Steering Committee (DSSC) established in August 2001 in response to Space Communications reorganization.**
- ◆ **Andrew Dowen of JPL appointed Program Manager**
- ◆ **John Kelley of HQ M-3 continues as Program Executive. (He remains as CCSDS and SC13 Secretariats, MC chair person and US representative to ISO).**
- ◆ **Budgeting to come now mainly from NASA Enterprises (Space Sciences, Earth Sciences, Space Flight, others).**

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• **NASA DATA SYSTEMS STANDARDS REPORT** •

Mission Requirements

NASA Space Communications Services

| Space Flight | Space Science | Earth Science | | Space Flight | Space Science | Earth Science | | Space Flight | Space Science | Earth Science |

Technology Development   **Standards Development**   **Architecture Development**
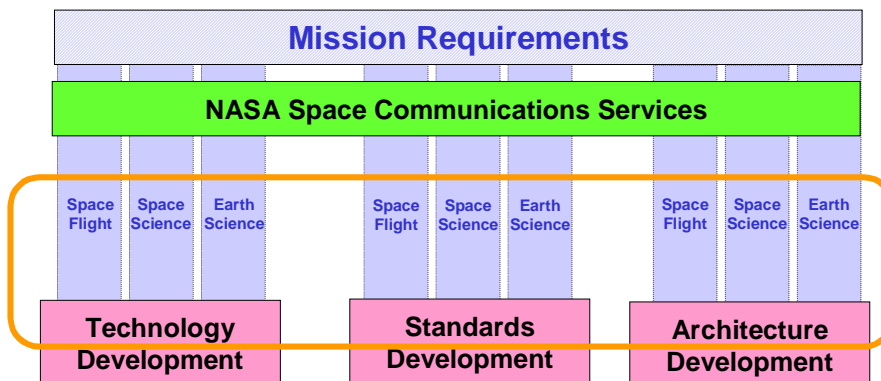
- ➢ **Architecture provides the NASA-wide systems engineering "glue"**
- ➢ **Technology, Standards and Architecture feed into Services**
- ➢ **The Enterprises influence the development lifecycle**

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• NASA DATA SYSTEMS STANDARDS REPORT •

New Budget Focus and Approach

- ◆ **For FY2002 and FY2003, the standards budget remains at approximately $2.6M.**
- ◆ **Starting in FY2004, program emphasis will be on the future communications needs of the Office of Space Flight, the Space Science Enterprise and the Earth Science Enterprise.**
- ◆ **Reliance on Enterprise funding to channel standards development**
- ◆ **Budget based on the mission set and mission needs and reflected in the Themes**
- ◆ **Fully coordinated, integrated and scrubbed among cooperating Offices (Space Flight, Space Sciences, Earth Sciences and Field Centers)**

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• NASA DATA SYSTEMS STANDARDS REPORT •

New Technical Scope

- ◆ **CCSDS Operating Plan themes revamped to respond to future missions**
  - ❖ **Total cooperation among NASA Enterprises and Office of Space Flight**
  - ❖ **DSSC also participated**
- ◆ **New Program Plan in works**
- ◆ **Scope expanded to cover all NASA Data Standards**
  - ❖ **Support of Office of Chief Engineer obtained**

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• NASA DATA SYSTEMS STANDARDS REPORT •

Work in Progress – Internal NASA

- **CCSDS Web Site Upgrade**
  - ❖ **Secretariat developed a new Web site consisting of coordinated set of pages containing new features and accessing new technologies**

  - ❖ **New design to be presented to Management Council**

- **Test Bed**
  - ❖ **NASA currently planning the establishment of an SLE testbed that will initially demonstrate conventional CCSDS formats over RAF and CLTU services**
  - ❖ **Plans underway to also conduct NASA/DoD interoperability tests with Air Force facility in Colorado Springs**

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Work in Progress – Internal NASA

- SLE
  - ❖ Transfer services have been implemented in the DSMS ground system for internal use and for inter-agency cross-support. Successful ground testing and validation has been performed, and commands have been sent to the Cassini spacecraft.

- Electra Payload
  - ❖ A re-usable transceiver being developed at JPL which implements the Proximity-1 spec for cross-support. Transceiver planned for use on:
    - NASA Odyssey Orbiter
    - NASA MER Rovers
    - ASI G.Marconi Orbiter
    - CNES Netlanders
    - Beagle-II Lander
    - NASA MRO Orbiter
    - CNES Premier Orbiter
    - NASA Mars Scouts/Smart Lander

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Work in Progress – External NASA

Johns Hopkins University (JHU)/Applied Physics Laboratory (APL)

◆ APL is actively inserting new CCSDS standards into its new missions
◆ CONTOUR: First to use the SLE Forward CLTU services for S/C
  ❖ Commanding, as well as using SLE commanding, from a non-JPL mission operations center
◆ MESSENGER: Second mission to use the CCSDS File Delivery Protocol (CFDP).
◆ JHU/APL is developing a hardware implementation of the CCSDS turbo coding standard for telemetry downlink.
◆ Air Force Satellite Control Network (AFSCN)
◆ AFSCN continues its investigation of the use of CCSDS SLE standards to support conventionally equipped missions.
◆ Tests are to be conducted using RAF and CLTU transfer services between Schriever base in Colorado and Quick Reaction Demonstrator (QRD) in New Mexico.

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• NASA DATA SYSTEMS STANDARDS REPORT •

Items of General Interest to the MC

◆ During preparation of NASA's Data Standardization to Program PEs, several interesting items were identified relative to past accomplishments:
  ❖ **Testimony of Users**
  ❖ **Missions using CCSDS Recommendations**
  ❖ **Companies marketing COTS CCSDS-compatible products**
◆ **Since most of these data relate to activities within the United States, CCSDS agencies are urged to identify similar, FUTURE activities within their respective countries.**

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• NASA DATA SYSTEMS STANDARDS REPORT •

Past Accomplishments – Users' Testimonies

- ◆ **Over 200 space missions have VOLUNTARILY adopted NDSSP Standards**
    - ❖ Data obtained from Web Search and Examining MRRs
- ◆ **Vendors Report an Order-of-Magnitude Reduction in Cost of Support Systems**
    - ❖ Space News Article, 1998 Int'l TLM Conf – by Mr. Michael Williams of Avtec
- ◆ **Numerous Companies are Marketing CCSDS-compatible Products and Services**
    - ❖ Database created from results received from a NASA Questionnaire
- ◆ **NDSSP Standards Enabled ISS to Interface with over 2000 Customers**
    - ❖ Quote from Mr. Robert Byington – Boeing Corp.   ISS Flight Software
- ◆ **Joint use of NDSS Recommendations by several agencies provide significant savings through cross support**

    (Example: Use of NDSS Recommendations by NOAA, ESA and DoD permitted one meteorological satellite to be cancelled without loss to program--saving some $100M.)

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• NASA DATA SYSTEMS STANDARDS REPORT •

Past Accomplishments – Mission Usage

MISSIONS   Presently Using / Planning to Use DSSC Standards

	Presently Using	Planning to Use
GSFC	**29**	**11**
JPL	**11**	**8**
Other	**11**	**8**
NASA	**51**	**27**
International	**54**	**37**
Other	**20**	**15**
TOTAL	**125**	**79**

available at: http://ccsds.gst.com

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• NASA DATA SYSTEMS STANDARDS REPORT •

Past Accomplishments – COTS Products

- ◆ **Sixty-six (66) companies – mostly American – have been identified as currently marketing some 114 CCSDS compatible products:**
  - ❖ **Hardware**
  - ❖ **Software**
  - ❖ **Support Services**
- ◆ **Details relative to COTS suppliers and products are available at: http://ccsds.gst.com**

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ATTACHMENT J.

NASDA REPORT

NASDA Report to CCSDS /MC (April, 2002)

1. Management
1-1 :Organization /Changes
Mr. Katagi was replaced as NASDA delegate by Mr. Nagashima.
NASDA requests to change the registered name of head of delegation accordingly.

> Agency Web site: http//www.nasda.go.jp/
> Head of Delegation and Agency Representative for Spacecraft Ids
> Postal Address:
> Mr. Ryuichi Nagashima
> National Space Development Agency of Japan (NASDA)
> 2-1-1, Sengen
> Tsukuba-city, Ibaraki, 305-8505 Japan
> Email: NASDA.CCSDS@nasda.go.jp
> Telephone: +81-298-68-2570 (Ryuichi Nagashima)
> FAX: +81-298-68-2995 (Ryuichi Nagashima)
> Telephone: +81-298-68-2610 (NASDA CCSDS Secretariat)
> FAX: +81-298-68-2990 (NASDA CCSDS Secretariat)

Satellite Program and Planning Department of Office of Satellite Technology, Research and Applications is responsible organization in NASDA.
NASDA reactions to CCSDS outputs are coordinated in the Space Data System Committee which consists of about 25 members form several NASDA Offices, such as Transportation, Space Station, and so on.

1-2 :Areas of Agency Involvement
<Panel 1>
-Participating Spring meeting (P1F) and Document review:
  Time Code format: some comments
  Orbit data message: no comment
  CCSDS file delivery protocol (CFDP): no comment
  TM space link protocol: no comment
  Space packet protocol: no comment
  TC space link protocol: no comment
  AOS space link protocol: no comment
<Panel 2>
-Document review:
  DEDSL XML/DTD Syntax: no comment
  Open archival information system (OAIS): no comment
<Panel 3>
-Participating Spring meeting and Document review:
  SLE Service Management Specification: some comments

1.3 :Task and Manpower allotment within NASDA.

Ryuichi Nagashima: Head of Satellite Program and Planning Dept. CCSDS-related
activities
TSG/MC/ISO Mikio Sawabe (Coordination of Engineering matter and external affairs
and supporting SC-13 National Committee of Japan
Panel 1 Hiroshi Anegawa (P1A and P1K)
    Kazuo Nakada (P1E)
    Yoshitaka Taromaru (P1F, supporting C=SC-13 National Committee of Japan)
    Mikio Sawabe (P1J)
    Shiro Yamakawa (Optical comm. W.G.)
Panel 2 Yoshio Inoue (Supporting SC-13 National Committee of Japan)
Panel 3 Yasunori Iwana /Koichi Shinohara
Contract CFDP and Secretariat Support: Approx. several man months in total
Total manpower has kept approximately 2 persons /year. None is exclusively dedicated
to CCSDS activities.

2. Implementation activities

2-1 :Spacecraft Utilizing SC-13 Standards

-ADEOS-II (Earth Observations Satellite; Launch in Nov. 2002)
  Only downlink science data is packetized
-JEM (Space Station; Launch in 2005)
  Uplink AOS/Downlink AOS
-HTV (H-2 Transfer vehicle; Launch in 2004)
  Uplink Telecommand/Downlink AOS
-ETS-VIII (Engineering test Satellite; Launch in 2004)
  Uplink Telecommand/Downlink AOS
-ALOS (Land Observation Satellite; Launch in 2004)
  Uplink Telecommand/Downlink AOS
-SELENE (Selenological & Eng. Explorer; Launch in 2005)
  Uplink Telecommand/Downlink AOS

2-2 :Ground Facilities Utilizing SC-13 Standards

<S-band ground network for Space Operation>
New 6 ground stations will be starting operations on June 2002.
Uplink : CDSDS Telecommand, Downlink :CCSDS AOS, Range :Tone
Locations of new ground stations:
    Katsiira in Japan
    Masida in Japan
    Perth
    Santiago
    Maspalomas
    Kiruna (will be starting operation on Dec. 2002)

<Space Network>
CCSDS packet data processing equipment (both high rate and low rate) is installed in the DRTS (Data Relay Test Satellite) BBE located in Tsukuba Space Center and Hatoyama Earth Observation Center. Also, low rate CCSDS packet data processing equipment is installed in the ARTEMIS utilization system BBE located in ESA Redu station.

3. Documentation activities
3.1 :Agency adoption of SC-13 Standards
3.2 :Translation Activities
NASDA decided to use the original English version as is.

4. Technical activities
4.1 :Status of action items

A/I Number	Description	Status Report
MC-S01-A02	Each Agency should provide brochures, etc. for distribution at the 20th anniversary session.	NASDA is in preparation

4.2 :Status of on-going assignments
None
4.3 : Status of Liaison activities
5. Conclusions/Issues

ATTACHMENT K.

ISAS REPORT

ISAS REPORT TO CCSDS MANAGEMENT COUNCIL

DLR/GSOC, Germany, April 18-19, 2002

Takahiro Yamada

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1. IMPLEMENTATION OF CCSDS RECOMMENDATIONS

1.1 ONBOARD - Space Link Protocols

Spacecraft	Mission	Launch Year	TLM Pkt	TLM Frm	TLM Code	TC Pkt	TC Frm	TC Code
PLANET-B	Mars orbiter	1998		✔	✔			
MUSES-C	Asteroid sample return	2002	✔	✔	✔	✔	✔	✔
LUNAR-A	Lunar penetrators	2003		✔	✔			
ASTRO-F	Infrared telescope	2004	✔	✔	✔			
ASTRO-E2	X-ray telescope	2005	✔	✔	✔			
SOLAR-B	Solar observatory	2005	✔	✔	✔			
PLANET-C	Venus orbiter	2007	TBD	TBD	TBD	TBD	TBD	TBD

1.2 GROUND - Space Link Protocols

Complex	Function	TLM Pkt	TLM Frm	TLM Code	TC Pkt	TC Frm	TC Code
SSOC	Spacecraft Control Center	O	O	-	O	O	O
KSC	Ground Station (Near Earth)	O	O	O	W	W	-
UDSC	Ground Station (Deep Space)	O	O	O	W	W	-

O: Operational, W: Will be available shortly

1.3 GROUND - Space Link Extension

ISAS uses SLE services (RAF and F-CLTU) for data transfer between ISAS and JPL for MUSES-C. The first round of testing between ISAS and JPL was performed in October 2001, and was successful. ISAS also uses XML-based SLE Service Management for this project as a method of requesting services to JPL.

ISAS uses SLE services (RAF and F-CLTU) for data transfer between ISAS and NASDA for some future projects.

2. PANEL ACTIVITIES (November 2000 to April 2002)

2.1 PANEL 1

The following book edited by ISAS was published by CCSDS as a Green Book:

Overview of Space Link Protocols.

The following book edited by ISAS was published by CCSDS as a Blue Book:

Space Link Identifiers.

The following books edited by ISAS were published as Red Books for Agency review:

Space Packet Protocol,
TM Space Data Link Protocol,
TC Space Data Link Protocol,
AOS Space Data Link Protocol.

The following books edited by ISAS were approved by the MC for publication as Red Books. But these books needed to be revised (due to changes in the original Blue Books and comments received from Panel members) and new White Books were distributed:

Communications Operation Procedure-1 (COP-1),
TM Synchronization and Channel Coding,
TC Synchronization and Channel Coding.

These books will be published as Red Books shortly.

ISAS edited the following White Book, which is being discussed in P1A:

Encapsulated Service.

ISAS is editing the following White Book:

Space Link Implementation Chart.

This book contains a template for describing the parameters of the Space Link Protocols implemented on a project. This template will be a subset of the Service Agreement defined in the SLE Service Management Specification. Since the latter specification is still being finalized, ISAS is waiting for it to be finalized.

ISAS plans on editing the following Green Books:

Space Packet Protocol,
Space Data Link Protocols.

2.2 PANEL 3

ISAS actively participated in the review of the following Red Books:

SLE Service Management Specification, Red Book 1,
SLE Service Management Specification, Red Book 2,

SLE Service Management Physical Layer Managed Object Specification, Red Book 1.

2.3   Technical Steering Group (TSG)

ISAS is leading the newly created Working Group on Spacecraft Monitor and Control (SM&C) and edited a White Paper that describes problems, requirements, rationale and architecture associated with SM&C standards.

ISAS is leading discussion on architectures used by various Panels and Subpanels of CCSDS.

2.4   Management Council (MC)

ISAS proposed a standard table for controlling the status of documents generated by Panels and Subpanels.

3.   OTHER ACTIVITIES RELATED TO CCSDS

3.1   Interagency Operations Advisory Group (IOAG)

ISAS supports the activities of the Interagency Operations Advisory Group (IOAG) and actively participates in its meetings.

3.2   Interagency Consultative Group (IACG)

ISAS supports the activities of the Interagency Consultative Group (IACG), and is an active member of Working Group 4 which discusses interoperability issues.

4.   AVAILABLE MANPOWER RESOURCES

Only one person is available at ISAS to support CCSDS, and he does this work on a part-time basis. The manpower available to support CCSDS in this year (2002) is roughly 1/3 man-year.

ATTACHMENT L.

PANEL 1 REPORT

P1 Chairman Report to the MC
April 2002

Contents

1. Meetings
2. State of Activities
3. Resolutions
4. Considerations for MC
5. TSG General items

1. Meetings (1)

• November 2001 Meetings

Series of Sub-panel meetings took place in the time frame November 01-09 2001as follows:

• P1A,P1B,P1C and joint P1A/P1B at Frascati, Italy, November 05-09, hosted by ESA/ESRIN

• P1J and P1K at Noordwijk, Nederland, November 05-09, hosted by ESA/ESTEC

• Joint P1A/E, November 1st and P1J/K ,November 09, at Noordwijk

• P1E and P1F face-to-face fall 2001 meetings have been cancelled due to circumstances; P1F has been replaced by interoperability testing sessions and RID review via E-mail

• No formal Panel 1 Plenary took place in fall 2001; informal meeting was organized at ESTEC, November 1st, in replacement of the cancelled TSG meeting, for discussions on CCSDS testing, New Generation Space Internet, Spacecraft Monitor and Control

1. Meetings (2)

•April 2002 Meetings

• P1 Sub-panel meetings just took place last week (8-12 April 2002) in ESA establishments: P1E at ESA Paris (8-10 April), all other meetings including P1 Plenary and joint meetings at ESOC Darmstadt

•Fall 2002 Meetings

•Sub-panels and Panel 1 plenary in fall 2002 in US are being coordinated with Houston World Space Congress event. Preferred solution is all sub-panels (Except P1E), joint meetings and P1 Plenary meeting near to Houston September 30 to October 08, just before TSG and MC.

2. State of activities (1)

- **Sub-panel P1A**
  The Sub-panel worked on the following subjects:
- Command Operations Procedures COP1
- Restructured Red Books
- Overview of Space Link Protocols Green Book
- Time Code Recommendation Pink sheets
- Coordination with P1E and P1B for Proximity-1 (COP-P)
- Coordination with P1B for AOS Frame Length and Block Code Interleave Depth
- Security in Panel 1A Documents
- Coordination with P1F for Space Internet Link Layer

2. State of activities (2)

- Sub-panel P1B

  The Sub-panel worked on the following subjects:

- Channel Coding Green Book
- Extension of R/S coding to I=8,16
- Coordination with P1A for Restructured Coding Book
- Coordination with P1A and P1E for Proximity-1
- Advanced Coding investigations and implementations
- Analysis on eventuality to adopt DVB-S coding and synchronization standard in Proximity-1

2. State of activities (3)

- Sub-panel P1C

  The Sub-panel worked on the following subject:

- Image Lossy Data Compression further investigations

2. State of activities (4)

- Sub-panel P1E

  The Sub-panel mainly worked on the following subjects:
  - Coordination with P1A and P1B for Proximity-1
  - Coordination with P1B for modulation/coding interface
  - Bandwidth efficient modulation scheme Green Book

2. State of activities (5)

- Sub-panel P1F

  The Sub-panel worked mainly on the following subject:
  - File Delivery Protocol (CFDP) Red Book Review and final issue
  - CFDP Draft Green Book Part 1 and Part 2 New Issue
  - CFDP Interoperability Testing
  - Coordination with 1A for Next Generation Space Internet

2. State of activities (6)

- Sub-panel P1J

  The Sub-panel worked on the following subjects:

  - Recommendation for Orbit Data Messages: Review of Red Book in consistency with Green Book
  - Coordination with 1K for Time requirements
  - Discussion on language to be used for navigation data

2. State of activities (7)

- ## Sub-panel P1K

  The Sub-panel worked on the following subjects:
  - White Book including SOIF Reference Model and Implementation Model
  - Preparation of a SOIF Recommendation Structure
  - Timing Service (co-ordination with P1J to identify the applications needs)

3. Resolutions(1)

- ## Related to Sub-panel P1A (1):
  - 1. Panel 1A resolved (November 2001 meeting) to request the Management Council to adopt the Spacelink Identifiers Red Book Issue 1, CCSDS 135.0-R-1 to become the version 1 Blue Book: CCSDS 135.0-B-1, contingent upon editorial changes to be completed by the Secretariat.
  - 2. Panel 1A resolved (November 2001 meeting) to request the Management Council to adopt the Time Code Format Pink Sheets CCSDS 301.0-P2.2 to become the version 3 of the Time Code Format Blue Book CCSDS 301.0-B-3.

3. Resolutions(2)

- ## Related to Sub-panel P1A (2):
- 3. Panel 1A resolved (November 2001 meeting) to request the Management Council to allow the release date for the following documents , already approved for June 2000, to be changed to the actual anticipated date, between January and March 2002:
  - Space Packet Protocol
  - AOS Space Data Link
  - TM Space Data Link
  - TC Space Data Link
  - COP-1
  - TM Synchronization and Channel Coding
  - TC Synchronization and Channel Coding

3. Resolutions(3)

- ## Related to Sub-panel P1A (3):
- 4. Publish Encapsulation Service as Red Book for Agency review
- 5. Restructured book to be issued all together when in blue state (expected in fall 2002)

3. Resolutions(4)

- Related to Sub-panel P1B

  Issue of pink sheets for introduction of I=8 in RS coding

3. Resolutions(5)

- Related to Sub-panel P1C

  1. P1C sets as an objective to select one algorithm for the Blue Book on lossy data compression out of the 3 below, presented in the just completed white book:

  DWT+RunLength+HuumanCode (CNES)

  DWT+BPE (Hybrid Scheme) (ESA)

  MLT+BPE (NASA/GSFC)

  2. Algorithms can only be taken into consideration if performance can be cross-validated

3. Resolutions(6)

- ## Related to Sub-panel P1E

1. REVIEW OF RECOMMENDATIONS ON RESIDUAL-CARRIER MODULATIONS

PINK REC 2.4.3 TO BE CIRCULATED FOR AGENCY REVIEW

DELETE RECS 2.4.4, 2.4.5 AND 3.3.4 NOW REPLACED BY THE UPDATED 2.4.3

2. HIGH DATA RATES UPLINKS

CCSDS P1E TO ISSUE LIAISON STATEMENT TO SFCG TO INFORM OF CCSDS INTENTION TO OPERATE HIGH RATE TC IN THE E-S SR BANDS

3. NEW X/KA TURN-AROUND RATIOS FOR DEEP SPACE MISSIONS

PINK RECOMMENDATIONS 2.6.7B & 3.1.6B TO BE ISSUED FOR AGENCY REVIEW

3. Resolutions(7)

- ## Related to Sub-panel P1F(1):

The Sub-panel proposed (November 2001 meeting) the following Resolution for Panel 1:
Panel 1 resolves that, as soon as Sub-panel 1F has completed review of the CFDP Red Book and has demonstrated consensus to the Panel 1 Chairman, the resulting document will be forwarded to the Management council with the request that it should be converted to a Blue Book via mail ballot, along with corresponding issuance of the two corresponding Green Books as formal CCSDS reports.

3. Resolutions(9)

• Related to Sub-panel P1F(2):

Resolutions from April 2002 Meeting (1)

R02-05-01:
CCSDS Subpanel 1F resolves that the current CFDP Extended Procedures and the Store-and-Forward Overlay will be added to the Core capabilities to support serial multi-hop 'scenario 3' operations. Subpanel 1F requests permission to issue Pink Sheets to Blue Book 1 by the end of June 2002. A test program will be initiated with a goal towards maturing the Pink Sheets and issuing Blue Book 2 by Spring 2003.

R02-05-02:
CCSDS Subpanel 1F further resolves that in order to support an interim 'scenario 4 and 5' capability, specific guidance to project implementers will be generated for future addition to the Green Book regarding the design and use of a "CFDP Data Product Manager". The purpose of this capability is to enable CFDP operation in scenarios 4 and 5 by assuring that each file which CFDP is requested to transmit may be fully delivered to its proximate destination in a single transmission opportunity.

R02-05-03:
CCSDS Subpanel 1F resolves that it will study how the complete suite of "Scenario 1- 5" operations may be supported via standardized protocol by the development of the "Bundling" suite, possibly including a Long-haul Transport Protocol ('LTP') for use across backbone links. To initiate study of the Bundling development, NASA will provide the architectural rationale for Bundling and the draft specifications to the CCSDS Agencies by the end of June 2002. Agencies are invited to express their interest in participating in the Bundling development. A goal of the Subpanel is to progress the Bundling protocol on a timescale that is compatible with the needs of missions for fully standardized Scenario 4-5 operations.

3. Resolutions(10)

• Related to Sub-panel P1F(3):

Resolutions from April 2002 Meeting (2)

R02-05-04:
CCSDS Subpanel 1F further resolves that since the Bundling development will be performed via concurrent prototyping and specification, it will study how to expand the CFDP testbed capabilities into a formalized inter-Agency overlay network (the "BundleBONE") that will allow distributed developers to interact over normal Internet facilities.

R02-05-05:
CCSDS Subpanel 1F resolves that the NASA work in "Next Generation Space Internet" (NGSI) protocol development is within the scope of the program of work of the Subpanel and recommends that NASA should prepare four White Books for review and discussion by the Subpanel:

> **Dynamic Space Link Communications Services**
> **End-to-end resource reservation**
> **Mobile IP extensions for space missions**
> **Key management and secure gateways for space**

In addition, the following draft Green Book should be produced:

> **NGSII concept document**

The goal is to convert the four specifications to Red Books at the Autumn 2002 meeting, with a formal Agency review to be completed by the Spring 2003 meeting.

3. Resolutions(11)

• Related to Panel1 Plenary

1) Panel1 concurs with all Resolutions of its Sub-panels

2) Panel 1 resolves to request the Management Council to support the Sub-panels P1A, P1B and P1E joint proposal consisting in splitting the Proximity-1 Recommendation in 3 separate books corresponding respectively to Physical, coding and data link layers

4. Considerations for MC(1)

• Related to Sub-panel P1A

As a result of the discussion on Proximity-1 within the sub-panel, it was decided that Proximity-1 Spacelink Protocol should be issued as a draft Red-3 Book.

• Related to Sub-panel 1C

Exchange of software between agencies for performance cross-validation of lossy data compression algorithms is necessary for final selection. When this cannot be fulfilled in case of protection by a patent (case of CNES algorithm), the corresponding algorithm will not be taken into consideration by P1C

5. TSG General Items

P1 worked on the following TSG general items:

- Security in data communications

- Space Internet

- Testing in the frame of CCSDS

- CCSDS Architecture(s)

ATTACHMENT M.

PANEL 2 REPORT
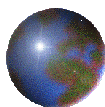
*Panel 2 Report to
Management Council
April 2002*

D Giaretta

Report Structure

- ◈ Status of activities
  - ▪ Roadmap
  - ▪ Document Tree/ Status
  - ▪ Organisation
- ◈ Work Progress
  - ▪ Actual production of documents
  - ▪ Accomplishments
  - ▪ Meetings
- ◈ Resolutions
- ◈ Conclusions/Issues

Road Map

Data administration		
CA Software	Control Authority Services	XML Registry/Repository
		Unique Naming
Open Archival Information Systems (OAIS)		
Reference Model	Interface Standards	Archive Accreditation Procedures
Data description languages and tools		
DDL (EAST)	Data Dictionary Specification	XML Schema	Interoperable Dictionaries
Information packaging		
Referencing Environment	Packaging	Multiple encoding
		Object Behavior

Workplan

Research	Development	Deployment
Requirements	**Languages**	**Software**

‼ XML implementation
  ○ DED
  ○ Packaging
‼ Standard Objects
  ○ Java based applications/ classes
‼ URN-type services from CAA
	‼ DEDSL
	  ○ XML **
	  ○ PVL **
		‼ EAST support
		‼ P2 Promotion
		‼ Control Authority services
		‼ CA Agent Services
		‼ Project usage
		  ○ PAE (ESRIN)
		  ○ Data migration (GSFC)
		  ○ CDPP (CNES)

‼ Archive services
  ○ Certification
  ○ Ingest
  ○ Identification
	‼ Archive Reference Model **
	‼ Ingest
		‼ OAIS workshops
		‼ External Project usage

‼ XML Schema DEDSL	‼ XML based Packaging	

Proposed Resolutions

None

- awaiting results of XML work

Document Tree/Status
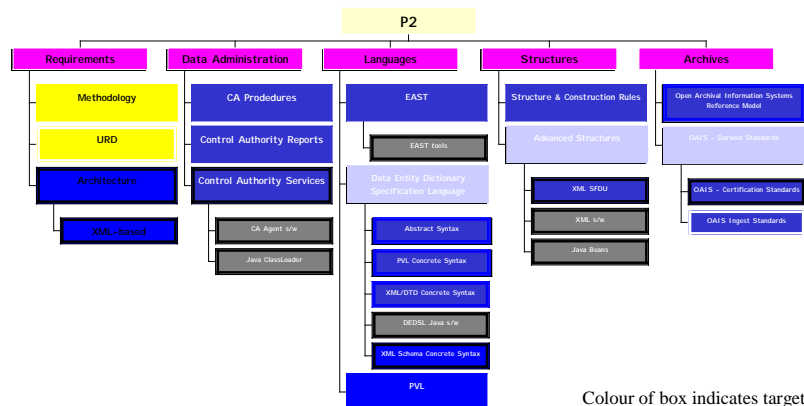
Colour of box indicates target of book (yellow/blue/green etc). Gray indicates software.

Border denotes state e.g. red/white. Black indicates work in progress

Accomplishments

- Progressing with Archive related standards
  - OAIS Ref Model increasingly widely used
    - E.g. as basis for new NSSDC system development
  - Ingest Methodology WB being prepared – draft RB for Fall 2002
- Control Authority software being upgraded by ESA
- XML
  - Working with TSG XML Ad Hoc WG
  - Packaging WB being prepared for Fall 2002
    - Packaging techniques
    - Packaging services
  - Interface description/behaviour under investigation
  - XML Schema for DEDSL being prepared
  - Registry/Repository Services and Data Structures

Accomplishments ….EAST.

- Supporting operation projects
  - SSALTO
  - Helios II
  - CDPP
  - DEBAT
- Future
  - Rosetta – use for telemetry processing
  - CADMOS – coordinating interfaces between several European centres
  - Possible interface for commercial Dynaworks tool used by Intespace

Meetings held/planned

- Full Panel meeting in Toulouse October 2001
- Telecons held as needed
- TSG XML Ad-Hoc Working Group workshop held at RAL 3-5 April 2002
- Panel 2 meeting held at RAL 8-12 April 2002
- Fall 2002 meeting planned: Houston
  - Week starting 30 Sept 2002

Plans for SpaceOps

Abstracts already submitted:
- Information Architecture
- OAIS Implementations
- Control Authority Office System (CAOS)
- XML Packaging prototype (Xpack)

To be submitted:
- Data Dictionary definition
- Advanced XML Packaging

ATTACHMENT N.

PANEL 3 REPORT

Panel 3

PROGRESS REPORT TO

TSG & Management Council

Maurice Winterholer
P3 CHAIRMAN

Report to MC - Oberpfaffenhofen, GE - April 2002

CCSDS
Panel 3   **Presentation Outline**

☞ **1.   General Status of Activities (April 2002)**
- **1.1   Current Objectives**
- **1.2   Organization**
- **1.3   Work Breakdown Structure and Work Packages Status**
- **1.4   Documentation Set and Status**

☞ **2.   Work progress since Baltimore (Workshop27 - November 02)**
- **2.1   Documentation production Objectives**
- **2.2   Achievements**

☞ **3   Outcome from WS 28 in Oberpfaffenhofen (9-12 April 02)**
- **3.1   P3 position on SLE-SM future activities**
- **3.2   SLE transfer services and SLE-API development**
- **3.3   New Work Item : Tracking Service**
- **3.4   Future meetings** : WS 28 in Houston 10/02or 03-->10/07or 10/08

☞ **4   Request to MC**
- **4.1   Approval of SLE-SM reorientation proposal**
- **4.2   Approval of SLE transfer Services blue books & of NWI Tracking Service**
- **4.3   provision of support from agencies for manpower and WGs chairs**
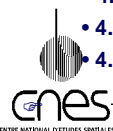
Panel 3 Workshop 28 Oberpfaffenhofen, GE April 8-12, 2002   *M.Winterholer* **2**

CCSDS Panel 3

General Status of Activities
1.1 Current Objectives

1. **Finalization of SLE SERVICES SPECIFICATION**
(**application** layer & **API** layer)

MC-F00-17
Development of SLE transfer Services recommendation for 1Q 2001

CLTU	**RCF**
RAF R-2	**FSP (similar to RCF)**

☞**MC-F00-18**
Development of SLE API recommendations for the implementation of SLE services over existing Telecommunication systems (TCP/IP, …) 1Q2001.

2. **development and review of the suite of**
SLE SERVICES & MANAGEMENT Specification books

3 .**Maintain Reference Model and Concepts books**

4. **Exploit Feed back from real testing and prototyping**

Panel 3 Workshop 28 Oberpfaffenhofen, GE April 8-12, 2002 *M.Winterholer* **3**

CCSDS Panel 3

General Status of Activities
1.2 current Organization

☞**Maintaining ORGANISATION of present Working Groups WG1, WG2/3, WG5**

☞**A General concern : insufficient man power in each group**

☞**A specific concern for WG5 : continuity of Chairmanship**

☞**List of Working Groups**
• **WG1 : a) SLE management service,**
b) SLE concept & Reference documents -- Chair F.Brosi NASA
• **WG2/3 : SLE transfer services specifications---- --Chair M Pilgram DLR**
• **WG5 : SLE Transfer services API & Security ---Chair M. Stoloff JPL**

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CCSDS Panel 3

General Status of Activities

1.3 Documentation Status (3/3) before WS 28

☞**suite of SLE SERVICES & MANAGEMENT Specification books**

1. *Introductory & tutorial materials* **:**
    SLE Brochure,
    SLE Executive Summary, (yellow book)
    Concept Green Book

3. *Recommendations* **:**
    SLE Service Management Red Book – 2
    SLE SM Space link physical layer M0s Red Book 1
    SLE SM Authentication Managed Objects (WB)
    SLE SM Mapping of (*) MOs to XML (WB)
    SLE SM Formal Specification of (*)MO and operations (WB)

    (*) MO = Managed Object

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CCSDS Panel 3

Work progress since Baltimore

2.1 Documents Production Objective(1/2)

	Current	2002		2003	
TCM	Green				
SLE Exec Summary	White	Yellow			
CS Concept	Green	Green-2			
CS Ref Mod	Blue	Blue 2			
SLE Service Management Suite					
SLE Service Mgmt	Red-2		Blue		
SM Formal Spec	White1.1	White1.2	Red 1		
Physical Layer	White		Blue		
Authentication	White	Red 1		Red	
SM Imp. Rules	White			Red 1	Blue
SLE Transfer Service Specifications					
SLE RAF	Red-2	Blue			
SLE RCF	Red-1	Red-2	Blue		
SLE FSP	Red-1	Red-2	Blue		
SLE CLTU	Red-2	Blue			
SLE ROCF		Folded into Combined Return book			
SLE RFSH					
SLE RSP					
SLE FTCF		Folded into Combined Forward book			
SLE TCVCA					
Tracking		Drafts	White 1	Red 1	Red 2
Combined Return	Draft	White	Red 1	Red 2	Blue
Combined Forward		White	Red 1	Red 2	Blue
SLE API Recommendations					
Concept/ Rationale	White	Green			
Programmer's Guide					
Tech Mapping	White		Red		Blue
Core Specification	White		Red		Blue
API–Return Svcs	White		Red		Blue
API–Forward Svcs	White		Red		Blue

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CCSDS
Panel 3

Work Progress since Baltimore

2.1 Achievements (2/2)

☞**Reference Model :** Rid disposition in process

☞**SLE Service Management**

Agencies review is closed . RID disposition in process.
Improvement of 2 prototype implementations by ESA (TSOA)and BNSC

New orientation of work proposed by NASA

☞**SLE Transfer Services :**
No work . Availability of mature Red books & a set of White Books

☞**Tracking service : preparation of a NWI**
Production of drafts (NASDA, NASA..)

☞**SLE API recommendations for the implementation of SLE transfer services over existing Telecommunication systems (TCP/IP, …)**
No work. Availability of five Mature White books based on JPL-ESA implementation

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CCSDS
Panel 3   **Outcome from WS 28 in Oberpfaffenhofen**

3.1   P3 position on SLE-SM future work

3.2   SLE transfer services and API development

3.3   New Work Item proposal : Tracking service

3.4   Future meetings

Panel 3 Workshop 28 Oberpfaffenhofen, GE April 8-12, 2002   *M.Winterholer* **12**

CCSDS Panel 3

3.1 P3 Position on SLE-SM future work

Conceptual Process for Developing SLE-SM Specifications (Overview)

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CCSDS Panel 3

3.1 P3 Position on SLE-SM future work

P3 Position on Current SLE-SM Suite

☞ **P3 should maintain the current SLE-SM suite, with RID process used to modify the content. *Ultimate goal is a set of Blue Books***
  - **Appropriate NASA Re-direction will be converted to RIDs**
  - **All Agency RIDs will be considered, including**
    - **Reducing scope to CLTU, RCF, RAF**
    - **Eliminating complications such as Event Handler**
  - **R2 RID review deferred until results of Lite book development can be fed back in**
    - **RIDs will be provided from the Lite development effort**
☞ **SLE-SM Specification, Formal Specification, and Space Link Physical Layer Managed Object (SLPLMO) Specification will be implementation and technology independent**
☞ **Purpose of the SLE-SM, Formal, and SLPLMO specifications will be as the reference specifications for concrete specifications**

Basically, the SLE-SM, Formal, and SLPLMO specifications will be transformed into books that acceptable are to Agencies

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CCSDS
Panel 3

3.1 P3 Position on SLE-SM future work
SLE-SM Lite

- **"*Lite Operational Requirements for SLE Ground Station TTC Services*"   will be documented**
  - **Independent of XML**
- **"*SLE-SM Lite XML Specification*" will be developed**
  - **Support the Lite requirements for TT&C operations**
  - **Capabilities will be a subset of those of the SLE-SM specification**
  - **Standalone (that is, users will not need to look at the top-level SLE-SM specification)**
  - **Service Requests will be addressed in the initial version of the book (real-time reconfigurations and monitoring may be added eventually)**
  - **Technically, it will ultimately match the the SLE-SM specification**
  - **Starting point will be the current SLE-SM specification, with the XML Mapping Rules applied**

Basically, the SLE-SM Lite XML Book will be one concrete specification derived from the SLE-SM specification (for the Lite operations mode), that just happens to use XML (Other mappings - e.g.,Java RMI - can be considered as well)

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CCSDS
Panel 3

3.1 P3 Position on SLE-SM future work
Lite Operational Requirements for SLE Ground Station TTC Services

- **Major sequence of interactions between UM and CM**
  - **Service Agreement (years in advance)**
  - **Schedule contacts (months to weeks in advance)**
    - **Identification of contact opportunities (query)**
    - **Communication of intent to reserve/utilize contact opportunities**
    - **Confirmation of contact opportunities**
  - **Submission of trajectory data (weeks to days in advance)**
    - **May be asynchronous with respect to contact scheduling, service requests, and service package execution**
  - **Submission of SLE Service Packages (weeks to days in advance)**
  - **SLE Service Package execution**
    - **No real-time status reports**
  - **Post Pass Report (some time after end of service package execution)**

- **Items for further study and definition**
  - **Service Agreement contains all the information that is captured in DSN PSLA and DMR that is needed for this concept**
    - **How does it map w/respect to current SLE SM Model?**
  - **Notion of alternate and/or backup service packages?**
    - **Emergency switch message definition? (Near-term implementation via voice-loop)**
  - **Persistent information at CM consistent w/confirmed contact opportunities**
  - **Test-mode submission (of service packages)**

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CCSDS Panel 3

3.1 P3 Position on SLE-SM future work

SLE-SM Lite XML Specification

- **Addresses only the content of the management information exchanged between Utilization Management (user) and Complex Management (provider)**
- **State information of low-level managed objects is not maintained/recorded/reported (for cross-support management)**
- **XML schemas will use the attributes and other information captured in the SLE-SM suite**
- **Supports the Lite Operational Requirements**
- **XML schema developed incrementally, addressing mandatory capabilities first**
- **Structured so that additional capabilities can be added easily, even after the first version has gone Blue**
- **Will be validated using actual missions**

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CCSDS Panel 3

3.1 P3 Position on SLE-SM future work

Proposed Roles and Initial Schedule for Executing Conceptual Process

- ☞ **NASA (JPL/GSFC/GST) will produce RIDs from NASA proposal – early May 2002**
- ☞ **BNSC will take over editing and administration of the SLE-SM suite and RIDs – on a continuing basis**
- ☞ **Members of WG1 will review RIDs and determine relevance and disposition wrt SLE-SM and Lite versions –**
  - **RID evaluation for input to Lite version – mid-June 2002**
  - **RID review for full version - deferred until Oct 2002**
- ☞ **NASA (JPL) will produce and maintain Lite Operational Requirements document**
  - **First review draft – end of May 2002**
  - **Comments due from Agencies – end of June 2002**
  - **First work-to version – July 2002**
- ☞ **NASA (JPL/GST) will create and maintain SLE-SM Lite book**
  - **Initial version available to P3 members – early Sept 2002**

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CCSDS
Panel 3

3.1 P3 Position on SLE-SM future work

Proposed Roles and Initial Schedule for Executing Conceptual Process (concluded)

6. **NASA (JPL) will create XML Schema corresponding to Lite SLE-SM book and make it available to P3 members for review and comment**
   - **First partial draft version available Oct 2002**
7. **NASA (JPL/GST) will produce Lite SLE-SM XML Specification White and Red Books, and provide them to P3 members for review and comment**
   - **Stable Red by Oct 2003 for evaluation for use by NASA GSFC Ground Network (GN)**
8. **NASA (JPL), ESA, and ISAS will prototype Lite SLE-SM XML capabilities (in parallel with development of the specification (item 7))**
9. **NASA (JPL/GST), ESA, and ISAS will produce RIDs resulting from prototyping**

cnes
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CCSDS
Panel 3

3.2 SLE transfer services and API development

RAF & CLTU service books

➔ **RAF/CLTU**

- Updates were delivered during the last week.
- RAF (911.1-R2.4)
- CLTU (912.1-R-2g)
- It was decided to transfer the responsibility to DLR.

- **Final Versions are now elaborated and they are ready to go blue !**

   - **RAF   911.1-B-1**

   - **CLTU   912.1-B-1**

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CCSDS
Panel 3

3.2 SLE transfer services and API development

RCF & FSP & Combined services books

➔ **RCF**

• Responsibility changed to DLR to finalize the R2 version one month after the RAF is published blue.

➔ **FSP**

• ESA (W.Hell) was requested to finalize R2 version before the next plenary.

➔ **Combined books**

• Combined books are still in the row for production. As decided NASA will work on a WB on forward services and CNES will work on a white book on return services for the next workshop.

➔ **Production Planning**

Books	WS28 Apr 02	WS29 Okt 02	WS30 Apr 03	WS31 Okt 03	WS32 Apr 04	WS33 Okt 04
CLTU (DLR)	B					
RAF (DLR)	B					
RCF (DLR)		R2	B			
FSP (WH)		R2	B			
Comb. Forward (PN)		W	R	R2	B	
Comb. Return (MV)		W	R	R2	B	

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CCSDS
Panel 3

3.3 New Work Item proposal

Tracking service

❖ **The proposal is to initiate the work and the adequate cooperation with P1J**

✷ **Develop a " Concept & Rational for Cross support Tracking Service" :**

• **fall 2002   WB1,**

• **end of 2002 WB2 for Agencies validation**

• **spring 2003 Green book**

✷ **Develop a first draft for " Real Time CS Tracking Data Transfer Service in may 2002**

❖ **Related short term action items**

✷ **Provide Agency Position Papers on Tracking to G. Theis (ESA)** *All Agencies – May 2002*

✷ **Collect Tracking Position Papers from P3 Members and draft White Paper   (ESA) – Fall'02**

✷ **Produce Draft Tracking White Book - (NASDA) - End of May 2002**

Panel 3 Workshop 28 Oberpfaffenhofen, GE April 8-12, 2002 *M.Winterholer* **22**

CCSDS Panel 3

P3 Requests to MC

☞

☞**Request for approval of**

- **4.1**   **SLE-SM P3 reorientation proposal**

- **4.2**   **SLE transfer Services RAF & CLTU blue books**
            & other SLE transfer services & SLE API work plan

- **4.3**   **" SLE Summary executive" going to YELLOW**
                 and X support Concept book going to GREEN 2

- **4.4.**   **NWI : Tracking Service**

- **4.5**   **provision of support from agencies for manpower**
                 and WGs chairs confirmations

☞
Thanks to DLR for excellent hosting

Panel 3 Workshop 28 Oberpfaffenhofen, GE April 8-12, 2002   *M.Winterholer* **23**

ATTACHMENT O.

TSG REPORT

TSG Report

to

CCSDS Management Council

Oberpfaffenhofen

April 2002

M. Drexler DLR-GSOC

April 2002   M.Drexler / GSOC   1

TSG Report

- The TSG meeting took place at the DLR premises April 15th – 17th 2002, discussing the following items:
- CCSDS Testing
- Architecture
- XML Working Group
- Spacecraft Monitoring & Control
- Space Internet
- Security
- Panel Status

April 2002   M.Drexler / GSOC   2

TSG Report
CCSDS Testing

- CCSDS wide coordinated testing effort initiated at the 2001 spring Pasadena TSG
- Until now two workshops in 2001: Noordwijk, Washington
- Workshop at DLR:
    - Report of 2001 workshops reviewed at the DLR TSG and updates discussed in:
        - Testing of Recommendations
        - Testing of Products
- Integrated CCSDS approach discussed: no agreement reached upon need
- Report to be harmonized within 1 month and distributed within TSG members for review and comments
- Review at next TSG meeting

April 2002   M.Drexler / GSOC   3

TSG Report
Architecture

- Reason: To generate a CCSDS architecture as required by the TSG charter and needed for the panels development work
- 7 Reports were given at the DLR workshop and questioned as:
    - What is the purpose of your architecture
    - Who uses your architecture
    - What is directly generated from your architecture
    - How is the architecture documented
    - What is the definition of the key terms

April 2002   M.Drexler / GSOC   4

TSG Report
Architectural Elements

Information Model
Systems Management Model
Operations and Connectivity Model
Communications Protocol Model
Service Model
Physical Architecture
Security Model

April 2002   M.Drexler / GSOC   5
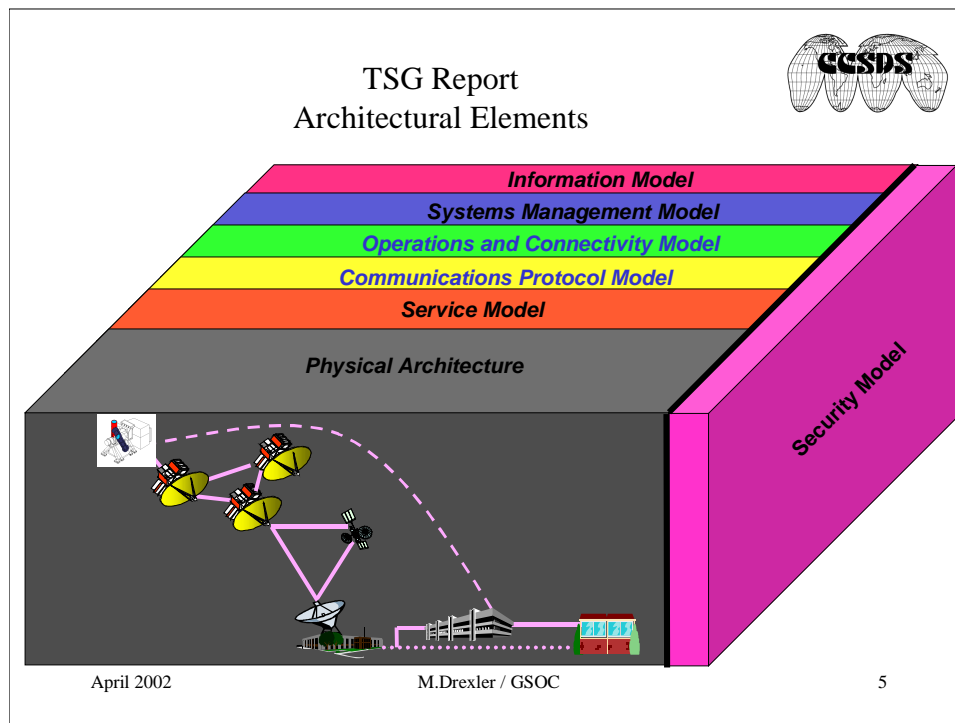
TSG Report
Architecture

- Resolution:
  - MC is asked to accept this activity and agencies are asked to allocate manpower
  - An architecture document must be a reference document of the strategic plan
- Schedule:
  - 6 months for first draft book and schedule definition (at October TSG/MC)
  - IOAG to be informed at its November meeting
  - Interoperability Plenary tentatively in June 2003 (last meeting in 1999)
  - 1 year required for mature book
- Manpower:
  - 2 MM for first draft and schedule development
  - Total man power t.b.d.

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TSG Report
XML Working Group

- The Management Council is asked to create an Architecture Working Group to define an overall CCSDS Architecture developing model views in the areas of
  - o Operations
  - o Information
  - o Systems management
  - o Connectivity
  - o Communications protocol
  - o Service
  - o Security
- This group will produce a book ready for agency review by June 2003, and presentation to the IOAG and the Interoperability Plenary.
- The work will be supported by an prototype for an operational framework for a distributed data system developed in parallel, and on the same timescale, to identify required services existing and in progress, such as SLE and Service Requests. This will feedback to and clarify the architecture and in particular the Information and Service model views. The prototype will be based upon XML and related technologies. The framework will define functions and interfaces intended to provide secure access (web based and otherwise) to space mission operational and science data resources.
- The prototype will build on and support work ongoing in the panels, as well as leveraging agency work outside CCSDS and COTS and free products which support XML and related technologies.

April 2002   M.Drexler / GSOC   7

TSG Report
XML Working Group, cont.
Planning

- Consolidation Phase
  - 3 months (1st Sep 2002 – 1st Dec 2002)
  - Outputs
    - Prototype Software Requirements
    - Draft ICDs
    - Implementation Plan
  - Manpower required   12 mm
- Implementation Phase
  - 6 months (1st Dec 2002 – 1st June 2003)
  - Outputs
    - Prototype
    - Documentation
  - Manpower required   30 mm

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TSG Report
XML Working Group, cont.
Manpower

	ESA	NASA GSFC	JPL SLE	JPL OODT	Total mm
Consolidation Phase	3	3	3	3	12
Implementation Phase	6	6	9	9	30

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TSG Report
Space Craft Monitoring & Control

- Until now two workshops in 2001: Noordwijk, Washington
- Three Reports given at the DLR Spring 2002 session
- TSG End to End Application Services WG proposed with
  - First work item: SM&C
- Resolution: MC asked to allocate manpower for this task
- Proposed Schedule:
  - Draft SM&C Services document and detailed work plan: at fall 2002 meetings
- Manpower for draft and plan: 2 MM

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TSG Report
Space Internet

- Until now among other activities two workshops in 2001: Noordwijk, Washington
- The Technical Concept was accepted from its technical approach at the DLR TSG with the following background:

Recognizing that:
- Some of the CCSDS Agencies have interest in operating their missions as so-called "nodes on the Internet"
- From a user viewpoint the CCSDS communications services that support such end-to-end space data exchange should permit user end systems to:
  - Use familiar Web-based interfaces
  - Run "commodity" protocols over "commodity" networks
  - Select among different qualities of service
  - Obtain guaranteed levels of on-demand security
  - Access on-demand end-to-end connectivity that is uninterrupted for the arbitrary duration of a user-defined session
  - Achieve fairly symmetric and simultaneously bi-directional data transfer
  - Observe low communications delay
  - Encounter negligible errors

And considering that:
- CCSDS has mature international standards in place that provide such services using either native Internet protocols or extensions to those protocols that have been specifically developed to address the requirements of the space mission environment.
- Those standards operate effectively over the international CCSDS space link protocols that are the preferred standards for space/ground data exchange within the Agencies.

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TSG Report
Space Internet, cont.

CCSDS resolves that:
- It recommends that the space mission organizations within the Agencies who wish to implement such "Internet-in-Space" capabilities should use the existing standard CCSDS capabilities and should feed back flight experience to CCSDS.
- It recommends that the organizations within the Agencies who provide multi-mission support infrastructure should implement the standard CCSDS "Internet-in-Space" capabilities when such requirements emerge.
- These recommendations will be transmitted by CCSDS to the organizations within the Agencies who are responsible for the development of missions and their supporting infrastructure.

Appropriate schedule and manpower plans are available from the last P1F report to TSG

April 2002   M.Drexler / GSOC   12

TSG Report
Security

- An important and mandatory item to all our products. Reason: security is well recognized in public domain and is a certification issue for all products. Issue was revitalized at last TSG
- Proposal: include Security Review in any review process as a mandatory review item. MC should not accept books if security not addressed adequately
- A presentation was given at the DLR TSG on panel inputs acquired since last TSG
- GB found as to be in good state (CNES Pleiades uses Option B in GB) but to be further developed
- Survey on Standards on the market done (ESA, NASA)

April 2002   M.Drexler / GSOC   13

TSG Report
Security, cont.

- Following steps proposed
  - Develop a CCSDS threat statement book
  - Develop a mission planner threat/risk analysis guide
    - Help guide for the mission planning process regarding security requirements
  - Develop a CCSDS security architecture
    - In close cooperation with other architecture developments
- Resolution: MC is asked to
  - approve the task
  - allocate manpower
- Possible Schedule
  - First issue of Threat Statement book within 3 months
  - Sound documentation available Spring 2003
  - Security Architecture can be worked on in parallel
- Required expert personnel to do the job is available.
- Estimated Manpower required:
  - First issue: 2 MM
  - Sound documentation: 6 MM

April 2002   M.Drexler / GSOC   14

TSG Report
Panel Status

- See the relevant panel reports
- TSG did not see any new work or cross support item to be addressed in its context in addition to the panel reports

April 2002   M.Drexler / GSOC   15

ATTACHMENT P.

DOCUMENT CONTROL TABLE

TSG Status Report
Technical Work Items
Panel Reporting

Document Control Table DCT

Document Title	TM Space Data Link Protocol
Technical Editor	Takahiro Yamada (ISAS)
Updates/Replaces	Packet Telemetry (CCSDS 102.0-B-5)
Current Version	CCSDS 132.0-W-0.3 (White Book Issue 3)
Proposed Resolution	Publish as Red Book 1 for Agency Review
Current Status	Discussed at P1A on October 18, 2000 and consensus reached. Discussed at P1 Plenary on November 28, 2000 and consensus reached
Green Book Status	High-level introduction is contained in 'Overview of Space Link Protocols', CCSDS 130.0-G-1 (a draft is available). A Green Book explaining all Space Data Link Protocols will be edited in 2001.
ISO Status	Will be proposed as Committee Draft at a later time.
Supporting Hardware or Software	This protocol is already used by many missions of the CCSDS Agencies.
Special Comments	This is one of the restructured Panel 1 Recommendations.

ATTACHMENT Q.
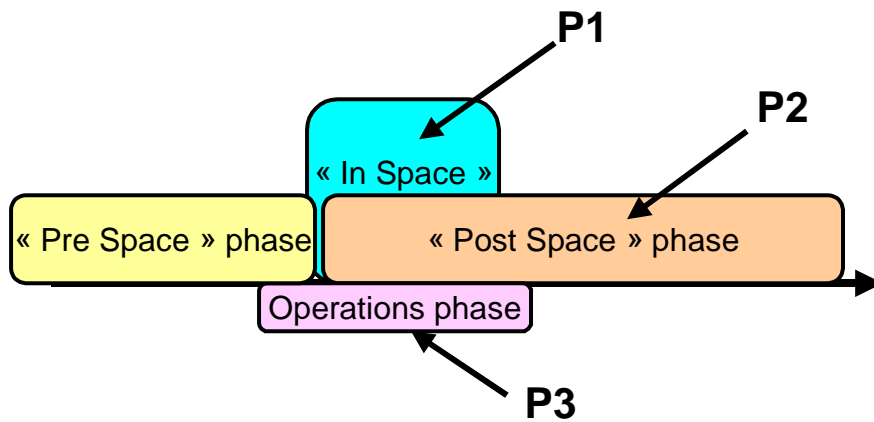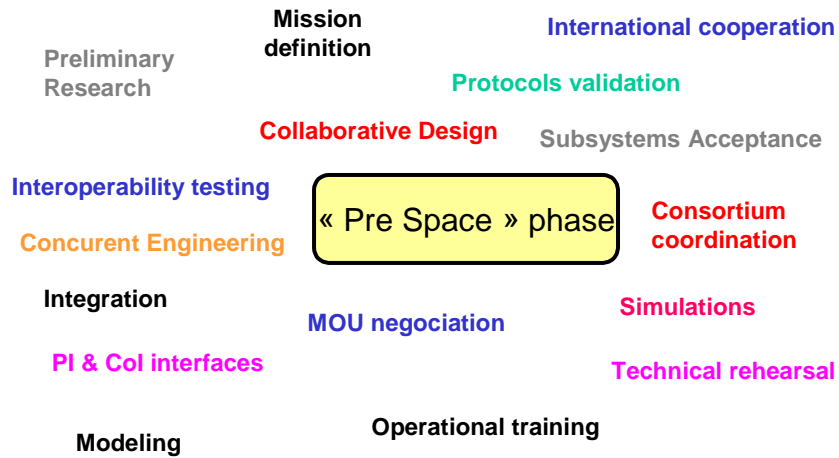
WORLD WIDE LAB

Space Activities

« World Wide Lab »

Concept

Robert Rumeau, CNES
(presented by Adrian Hooke)
CCSDS Management Council
April 2002

CCSDS Spring2002 Meetings

Space activities « life cycle »

P1

P2

« In Space »

« Pre Space » phase

« Post Space » phase

Operations phase

P3

« Pre-Space » activities

Mission definition

Preliminary Research

International cooperation

Protocols validation

Collaborative Design

Subsystems Acceptance

Interoperability testing

« Pre Space » phase

Consortium coordination

Concurent Engineering

Integration

Simulations

MOU negociation

PI & CoI interfaces

Technical rehearsal

Modeling

Operational training

« Pre-Space » activities

How emerging technologies could positively contribute to this « Pre-Space » phase ?

« Pre-Space » activities

Applicable technologies:

- **VPNs** (Virtual Private Networks)
- **Virtual meetings & Multi-Conferencing**
- **Remote Collaborative tools**

Aggregation leads to this Space WWL concept

a

« World Wide Lab » virtual environment
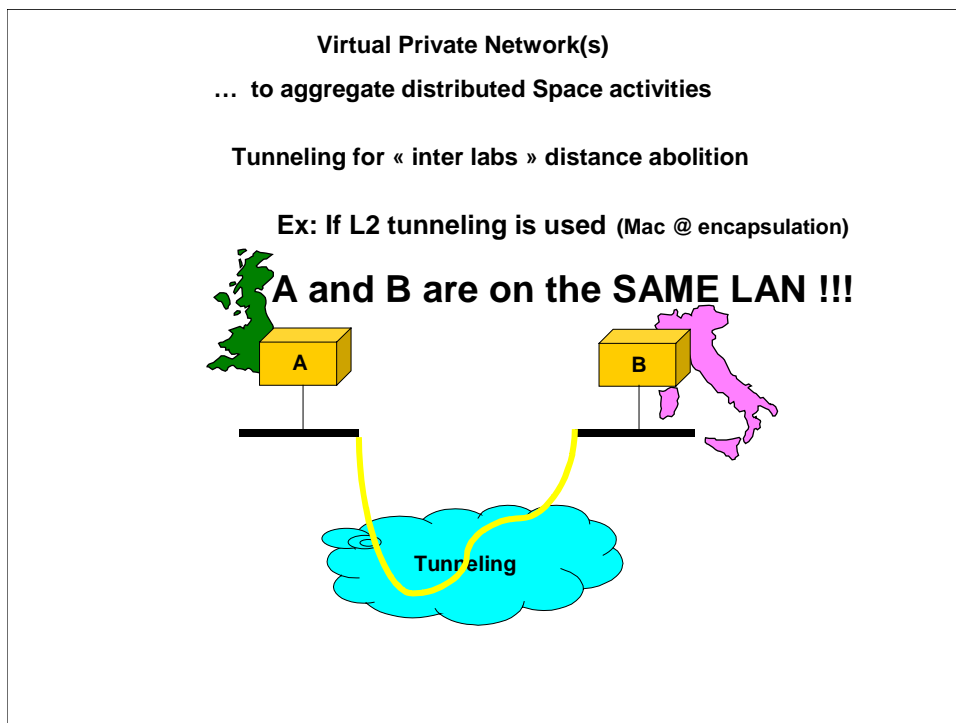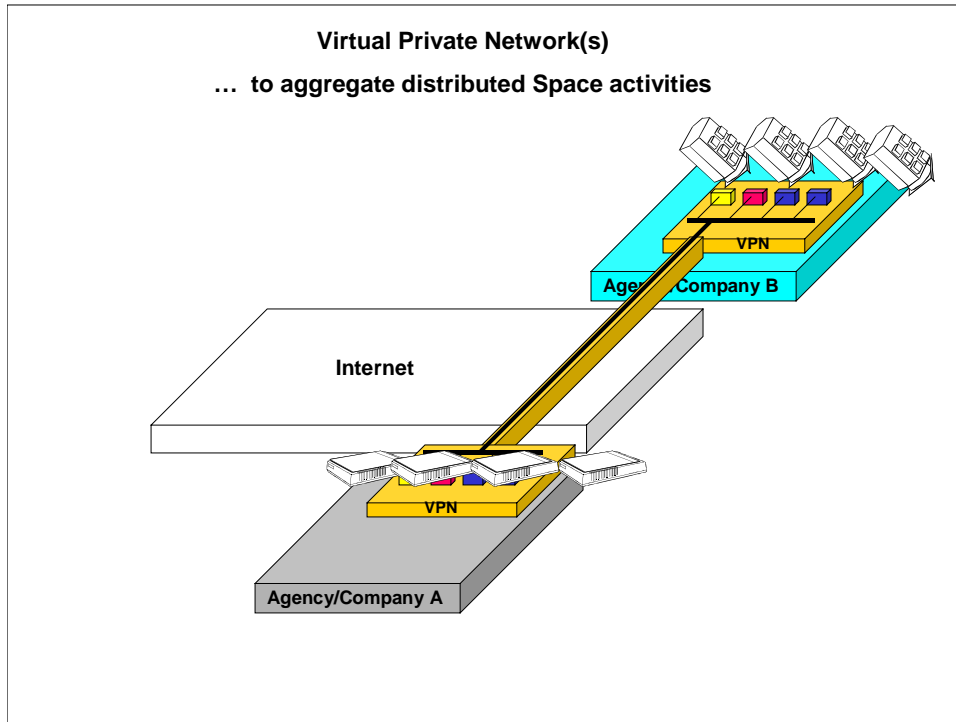

Chapter #1

Space WWLab

VPNs

ASPECTS

VPNs technologies:

an interesting tool

for

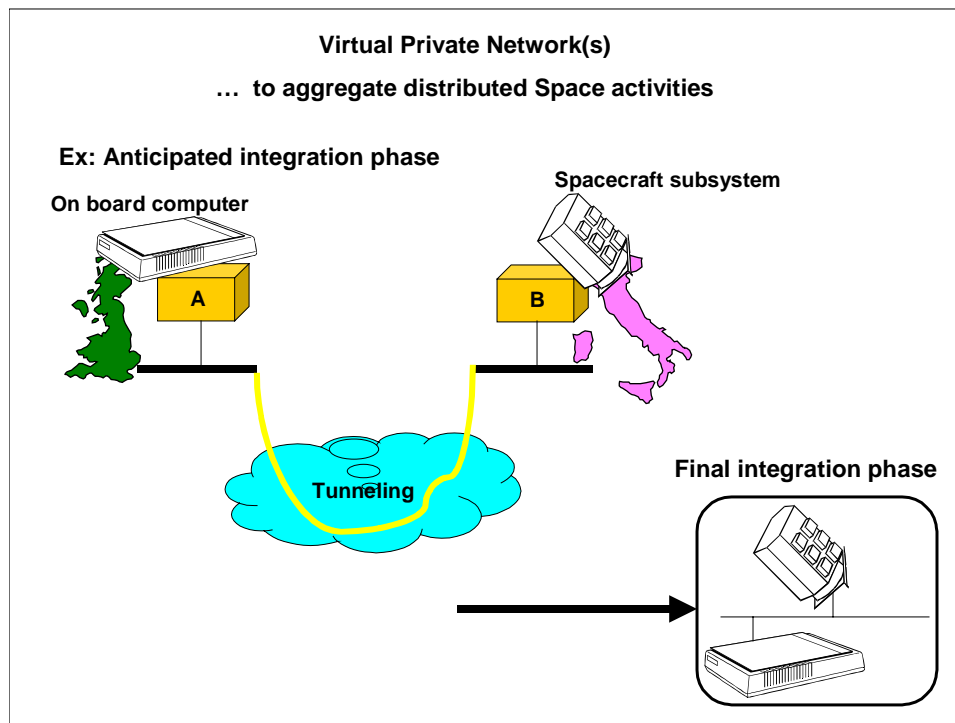## Distributed Space Activities
and
International Cooperation

Virtual Private Network(s) … for dummies … (1/2)

Virtual Private Network(s) … for dummies … (2/2)

Encapsulation

Tunneling Process

Decapsulation

Space VPN(s)

Internet

Virtual Private Network(s)

… to aggregate distributed Space activities

Virtual Private Network(s)

… to aggregate distributed Space activities

Tunneling for « inter labs » distance abolition

Ex: If L2 tunneling is used (Mac @ encapsulation)

A and B are on the SAME LAN !!!

Virtual Private Network(s)

… to aggregate distributed Space activities

Ex: Anticipated integration phase

On board computer

Spacecraft subsystem

A

B

Tunneling

Final integration phase

Chapter #2

Space WWLab

MULTIMEDIA

ASPECTS

HENP

(High Energy & Nuclear Physics)

Collaboration

Reference

Model

9580 Machines

5485 Registered Persons
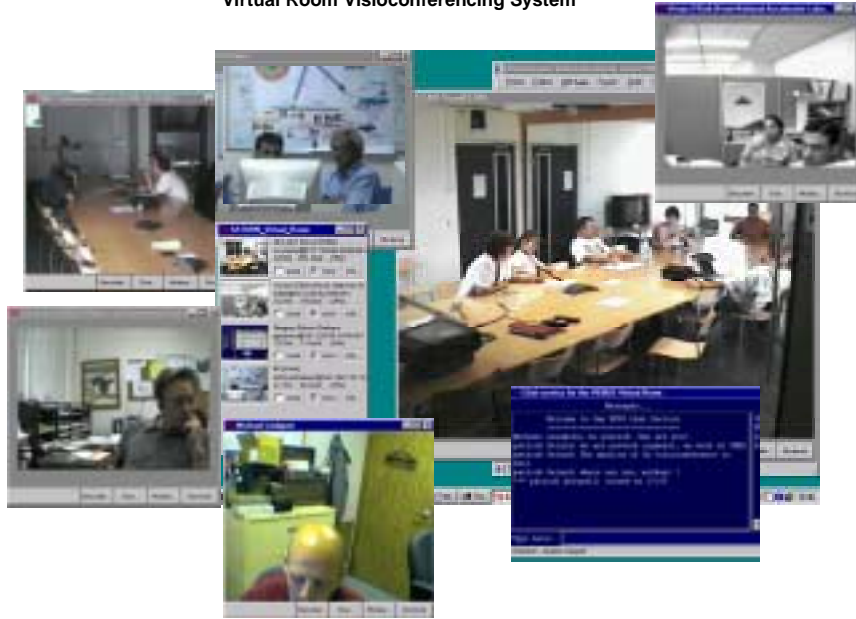
64 Countries

19 International reflectors

VRVS Charter
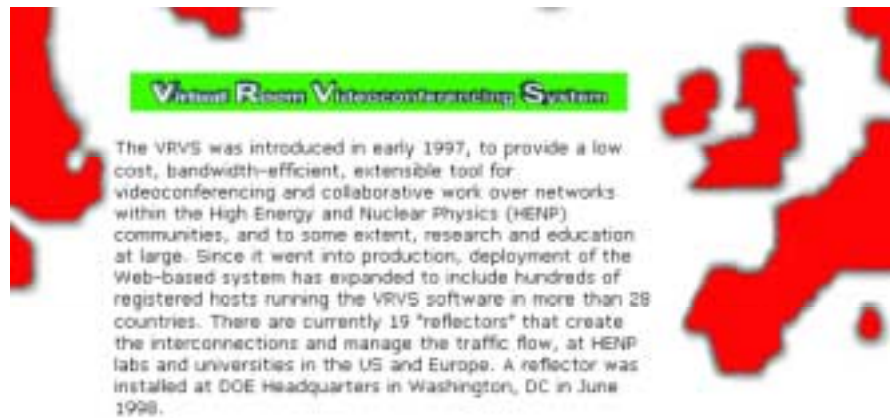
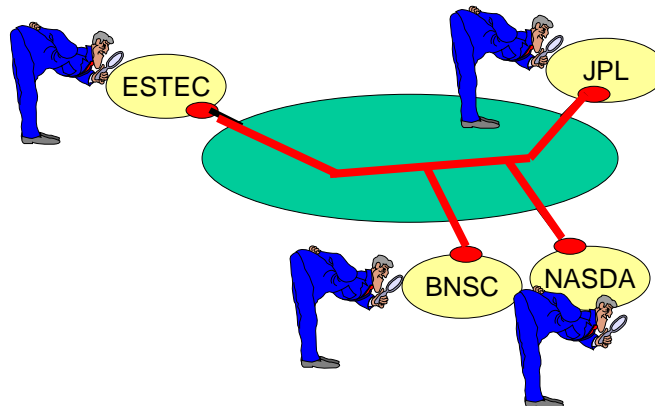## MULTI-PARTNER VISIO-CONFERENCING
Basic Principles
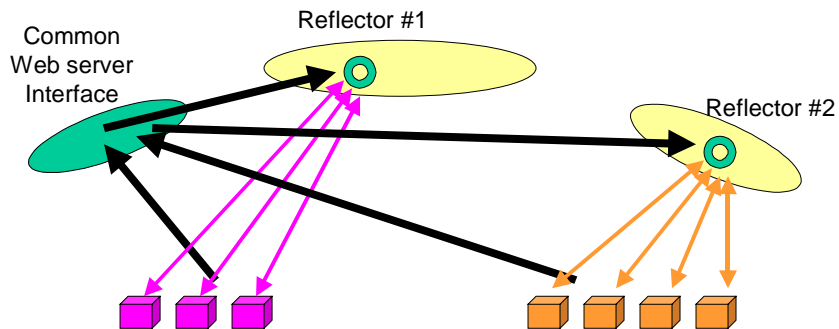
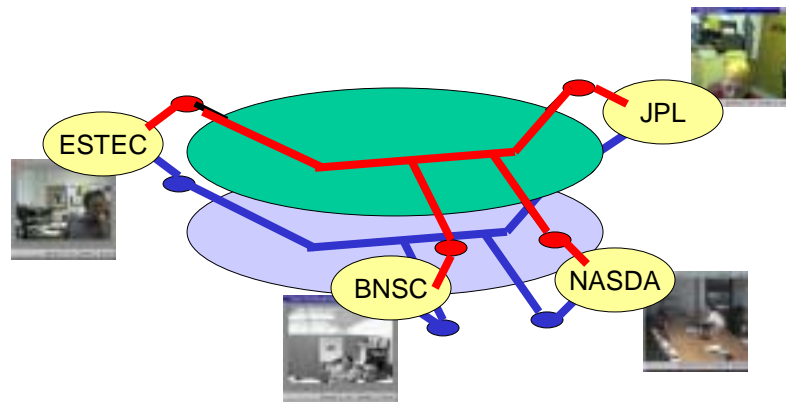**MULTI-PARTNER VISIO-CONFERENCING**
Virtual Room Visioconferencing System

Space WWLab Possible Start-Up Scenario:

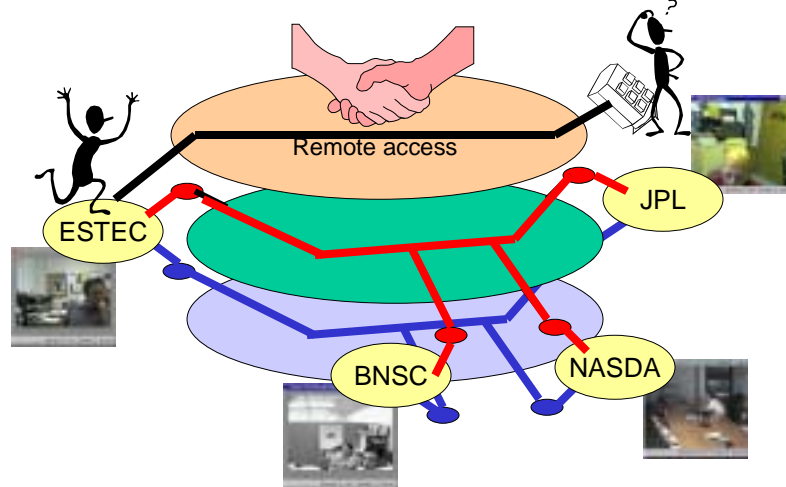**P1F / CFDP Protocol testing VPN**

Space WWLab sample #2:

Protocol « Visual testing/debriefing » VPN

Space WWLab sample #3:

Remotely configuring partner's device

Space WWLab « start-up » scenario

Can we get the Mars Exploration Program interested in this capability?